

The Reflexivity between ICTs and Business Culture: Applying Hofstede's Theory to Compare Norway and the United States

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Abstract

This study compares how workers in Norway and the United States use Information and Communication Technologies (ICTs). Our data—72 in-depth interviews of advanced ICT users—were coded, analyzed, and placed into Hofstede's four dimensional framework (power distance, uncertainty avoidance, individualism, and masculinity). We proposed that ICT use comparisons between the two countries are congruent to Hofstede's findings. We find partial support for these propositions. As expected, Norway and the US are similar on two dimensions (power distance and uncertainty avoidance), but contrary to expectations, they are also similar on the two dimensions where we expected differences (individualism and masculinity). We suggest possible explanations for these findings, including our focus on an expert-user subculture, external triggering events, and technical codes inscribed in Internet applications and software.

Keywords: Culture, Information and Communication Technologies, Hofstede, Cross-Cultural Studies, National Culture, Organizational Culture, Organizational Communication

Introduction

Modern technology is changing how much of the world now communicates, collects, stores, and distributes information. That transformation is being driven by Information and Communication

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Technologies (ICTs), which allow new ways of working in both the physical and the virtual world (Avolio, Kahai & Dodge, 2001; Mansell & Silverstone, 1997). The increasingly global nature of organizational relationships, fueled by the worldwide reach of these technologies, now enables exchanges across national borders (Drucker,

1993), sometimes blurring those same borders. Not surprisingly, much of the discussion in news media and trade magazines has focused on technical issues, especially the workings of the Internet and World Wide Web (WWW). Yet while the technology itself is compelling, these emerging ICTs are being used by people in social contexts, so it is critical to explore how people belonging to different cultures are affecting—and being affected by—ICTs.

It is important to study the relationship between culture and ICTs because organizations, at least in the western world, are increasingly facing the difficulty of managing and using the multiplicity of new ICTs, such as email, voice mail, WWW, cellphones, and videoconferencing. In addition, the sheer speed and ease of use of modern ICTs only serves to amplify these challenges. Hence, ICTs have become ubiquitous in organizations and most practices are now related to them. Because organizations progressively expand into global markets, it is critical for them to know how ICTs facilitate communication interorganizationally and across national borders (Ross, 2001). Here, embedding ICTs in organizations requires careful consideration of the implementing organization's culture and the cultures of the organizations and countries that will communicate with that organization (Ross, 2001; Westrup, Liu, El Sayed & Al Jaghoub, 2003). This challenge provides a reason to study ICT use across different cultural boundaries—i.e. national borders—especially since existing theories of ICT use are criticized for lacking cultural sensitivity (Stohl, 2001). While we have studied cultural differences between countries (e.g. Hofstede and others), we know less about how to use ICTs when communicating cross-culturally. What we currently know is that comparisons between cultures that are very dissimilar (e.g. US and Japan) consistently find that ICTs are used differently. This literature often suggests that communicators need to use ICTs differently when they communicate between cultures (Straub, 1994). One often cited cultural theory used to guide an understanding of cultural differences is Hofstede (1980, 1991). In this study we rely on Hofstede's work to examine the relationship between culture and ICT use in two countries that have much in common and where ICTs are diffused in a similar manner. Thus, we have both a theoretical and practical motivation for examining similarities and differences in ICT practices in Norway and the United States

In the following sections we explore the relationship between culture and ICTs to justify our contribution and approach. We review literature on how culture and ICT use affect each other and focus on studies that compare ICT use cross-culturally. Next, we introduce Hofstede's (1980) four-dimensional cultural framework to justify our research propositions. We then describe our methodological approach and present our findings, using narrative examples from the interviews. Finally, we provide explanations and discuss the implications of our findings relative to Hofstede's cultural dimensions.

Culture and ICTs

In this study, we rely on Hofstede's (1980) four-dimensional cultural framework to provide research direction. We use local indicators of culture, represented as individual reports of ICT use in organizations, to compare U.S. and Norwegian ICT use. However, a caveat is in order. We use Hofstede's framework of national differences only at the highest level of abstraction. This could be misleading unless we recognize that there are many different kinds, or layer of cultures, such as national, organizational, organizational subcultures or occupational cultures (Gefen & Straub, 1997; Hofstede, 1991). Furthermore, these layers, such as organizational culture, may be further conceptualized, as will be demonstrated later. Recognizing that it is problematic to generalize our findings to the national level, we use Hofstede's framework to guide and organize our analysis, because it is a seminal study of cross-cultural differences and has spawned hundreds of follow-up studies. However, the relationship between culture and ICTs must be elaborated.

Theoretically, ICTs are part of culture (Hofstede, 1991). ICTs, and the use of them, are examples of *cultural artifacts* or *practices* that can be examined as material manifestations of culture. Hofstede makes a distinction between national cultures and organizational cultures, both in the way of conceptualization and how to measure or compare cultures to each other. In short, when comparing organizational cultures, differences are found in *practices*. However, when comparing national culture, its *values* are used. The distinction and relationship between *practices* and *values* will be given in the following.

Hofstede defines organizational culture as “*the collective programming of the mind, which characterize the members of one organization from others,*” (1991, p. 237) and national culture as “*the collective programming of the mind which distinguishes the members in one human group from another*” (1991, p. 21). By “collective programming” Hofstede’s refers to four concepts that together make up culture and can be viewed and explained by using an “onion” metaphor. These concepts are: symbols, heroes, rituals and values. (See Figure 1 for a graphical representation of these concepts.)

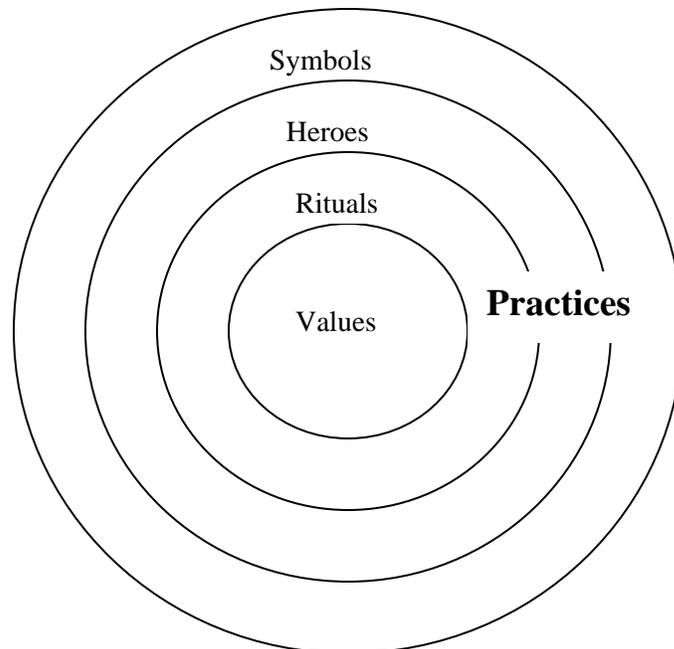


Figure 1: The “Onion Diagram”: Manifestations of Culture at Different Levels of Depth (Hofstede, 1991)

Symbols: The words and jargon of language, gestures, dress, pictures, objects, and status symbols all carry a particular meaning to people of the same national culture. Symbols disappear and new ones are easily created or copied from other cultures, thus symbols are placed at the outer and most superficial layer in the “onion” as they are not always unique to any particular culture. Hence, they are less significant when comparing culture.

Heroes: People, dead or alive, real or imaginary, have the ability to influence behavior based on their status, skills, or charisma. Managers can be examples of *heroes* if they have qualities that are highly valued and hence they actually model expected behavior in a given organization.

Rituals: These are activities that supposedly are unnecessary to the achievement of organizational goals, but they are something within a culture that is considered socially essential. An example of

a ritual can be daily coffee-breaks in the morning, a pay-day beer, or a manager that is known for walking around talking to employees throughout the day.

Hofstede calls these three concepts *practices*. *Practices* are observable and visible to an outside spectator, and can thus be measured and compared to *practices* in other cultures (Hofstede, 1991).

Values: At the core of the onion are values, or in Hofstede's words: "broad tendencies to prefer certain states of affairs over others" (Hofstede, 1991, p. 8). These values form the most hidden layer of culture, and represent the ideas that people have about how things "ought to be." As such, Hofstede emphasizes the assumption that *values* strongly influence behavior. Basically, values deal with feelings or preferences (e.g. evil vs. good, ugly vs. beautiful, abnormal vs. normal, etc.) and they influence the choices we make as we act in everyday situations.

Contrary to *practices*, *values* are acquired at an early age—in the home, from friends and kin, and at school. As values are not learned consciously, people are not mindful of them, nor can they be directly observed by outsiders. The only way to "measure" *values* is by inference—observing how individuals act in particular circumstances. Therefore, by observing or talking about actual *practice*—such as ICT user behavior—the *values* component of culture is included.

What can be summarized so far is that organizational culture can best be studied and compared by its *practices*, while national culture is best suited for study and comparison at the *values* level. As people within an organization are influenced both by shared *practices* and co-workers, they are prone to act in a way that separates them from people who work in another company or even sub-culture in the same organization. Therefore, according to Hofstede, the core organizational culture is the common understanding of day-to-day *practices*. As *values* are difficult to measure, because they are unconsciously manifested, researchers often have no other option than to measure national cultural differences by inference from current *practices*. Hofstede acknowledges this dilemma too, and states, "For systematic research on *values*, inferring them from people's actions is cumbersome and ambiguous." The distinction between national and organizational culture is thus clear at the conceptual level, but troublesome to measure and study at the national level—hence, difficult to compare to other cultures. Schein (1985) provides a similar conceptualization of the relationship between ICTs and culture. According to Schein, culture consists of three distinct levels, (1) artifacts and creations, (2) values, and (3) basic assumptions. ICTs are an example of level one – artifacts and level three—basic assumptions. Level one and three are connected because work-related assumptions—culture—may impact the specific ICTs people prefer to use, and how work is carried out.)

Review of Literature

The last three decades have produced a growing body of research that studies how organizations use ICTs (see Hollingshead & Contractor, 2002 for a review). By "ICTs" we mean all technologies that facilitate the handling of information and enable different forms of communication among human actors, between human beings and electronic systems, and among electronic systems (Hamelink, 1999). Prior research has focused on the following: media choice—how people make choices about the different media they use in their communication with others (e.g., Daft & Lengel, 1984; El-Shinnawy & Markus, 1997; Trevino, Daft & Lengel, 1990); media effects—how technologies can impact group interaction processes and group outcomes (e.g., Hilz & Turoff, 1978; McGrath & Hollingshead, 1993; Sproull & Kiesler, 1991) and the interaction between ICTs and group/individual interaction (e.g., Orlikowski & Robey, 1991; Poole & DeSanctis, 1990; Zack & Mckenney, 1995). Because the literature on ICT use and its sister terms in organizations is substantial (for reviews, see Dewett & Jones, 2001; Flanagan & Metzger, 2001; Fulk & Boyd, 1991; Garton & Wellman, 1995; Hollingshead & Contractor, 2002; Livingstone & Lievrouw, 2002; Straub & Karahanna, 1998), we will restrict our review to those

studies that inform our understanding of the relationship between ICTs and culture, and ultimately those studies that compare usage across national borders.

There are many studies that have uncovered relationships between ICTs and culture. Some, for example, have explored national cultural influences on technology development and innovation (Herbig, 1994), cultural influences on technology adoption (Straub, 1994), and culture as a factor in the diffusion of the Internet (Cronin, 1996; Goodman, Press, Ruth & Rutkowski, 1994; Maitland, 1999). Studies have also examined how technology affects national culture. Here, research has focused on how new ICTs change social structures (Latane & Bourgeois, 1996) and on the norms of communication (Caron, Giroux & Deuzou, 1989; Dutton, Rogers & Jun, 1987). When turning to studies comparing the relationship between ICT and culture across national borders, several studies can be identified. In Table 1 we have summarized the comparative studies of ICTs' impact on culture, and in Table 2 we have summarized comparative studies of cultural impacts on ICT practices.

Table 1. Summary of comparative studies on how ICTs impact culture

El Shinnaway & Vinze (1997)	Examined the impact of technology and culture in the process and outcomes of group decision-making in the U.S. and Singapore. They found that ICTs do indeed have an impact on group decision outcomes such as polarization. However, the impact of ICTs is quite different on the culture that dictates the norms under which a group operates.
Tan, Wei, Watson, Clapper, & McLean. (1998)	Tested the impact of ICTs on majority influence in individualistic (U.S.) and collectivistic (Singapore) culture. The results showed that the impact of ICTs was contingent upon national culture. Specifically, in individualistic cultures, majority influence was stronger in the unsupported setting than the face-to-face and dispersed ICT settings.
Latane & Bourgeois (1996)	Studied the impact of ICTs on social structures. They acknowledge that the proliferation of email networks has the potential to alter the dynamics of cultural change - that over time through interaction group members become more alike and their attitudes and beliefs become correlated.
Mejias, Shepherd, Vogel & Lazaneo (1996/97)	Did a cross-cultural comparison of GSS and non-GSS outcomes within and between the U.S. and Mexico. Their findings showed that Mexicans perceived higher levels of satisfaction and participation equity than their American counterparts with main effects due to culture.
Calhoun, Teng & Cheon (2002)	This study examines the use of ICTs for organizational decision-making. Decision-makers in Korea and the USA indicated their perceptions that the extent of information technology use impacted their decision-making activities. The results indicated that some behaviors changed presumably to take advantage of the technology, while others, particularly those associated with the cultural preference for communication, did not.

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Straub, Keil & Brenner (1997)	This study compares the TAM (Technology Acceptance Model) across three different countries: Japan; Switzerland; and the United States. The study was conducted by administering the same instrument to employees of three different airlines, all of whom had access to the same information technology innovation, in this case, email. The results indicate that TAM holds for both the U.S. and Switzerland, but not for Japan, suggesting that the model may not predict technology use across all cultures.
Rice, D'Ambra & More (1998)	Tested managers from four countries and their perceptions of media equivocality of four different media in work-related situations. Their findings show only moderate influence of cultural values, except that collectivistic cultures (Hofstede, 1980) tended to avoid the telephone for more equivocal situations.

Table 2. Summary of Comparative Studies of cultural impacts on ICT practices

Veiga, Floyd & Dechant (2001)	Discussed the effects of national culture, in Japan and the U.S. on the Technology Acceptance Model (TAM). The findings suggest that Hofstede's (1980) dimensions of cultural differences play distinct roles in influencing the TAM. For example, high uncertainty avoidance decreases the pace of individual learning.
Livonen, Sonnenwald, Parma, & Poole-Kober (1998)	Investigated Finnish and American college students who collaborated in a common course using electronic discussion groups. They found that cultural attitudes toward technology may influence people's beliefs and use of the technology. For example, students in Finland rated some applications higher than their classmates in the U.S.
Ulijn, Lincke & Karakaya (2001)	Studied 20 individuals from Europe (Nordic and Latin countries) and from North America (Anglo). They examined the effects of culture on non-face-to-face communication when people try to establish a cooperative win-win strategy. The findings show that non-face-to-face interactions allow a cooperative win-win strategy, but linguistic differences were found between low and high context countries (Hall, 1959).
Png, Tan & Wee (2001)	Compared the adoption of frame relay, a type of IT infrastructure, between the United States and Japan, using Hofstede's dimensions. Their findings suggested that uncertainty avoidance, one of Hofstede's dimensions, affected the adoption decision of companies differently in the two countries. Adoption was higher in the United States.
Straub (1994)	Studied the effect of culture on IT diffusion of email and fax in Japan and the U.S. His findings suggest that culture plays an important role in the predisposition toward and selection of ICs. However, findings on the use of face-to-face and telephone were similar between the two countries.

Leidner, Carlsson, Elam, & Corrales (1999)	Drawing on survey responses from managers using Executive Information Systems (EIS) across organizations in Mexico, Sweden, and the United States, the study examined whether cultural differences influence perceptions of the relationship between EIS use and decision-making outcomes. The study found significant differences, predicted by cultural factors, in the impact of EIS use on senior management decision-making.
Van Birgelen, Ruyter, Jong & Wtzels (2002)	Compared ICT use in after-sales service-and-support operations in Sweden, Belgium, France, Spain, Austria, Ireland, Netherlands, United Kingdom, Norway, and the U.S. The findings suggest that cultural characteristics will partly determine the design of effective after-sales service contact modes. More specifically, they warn about emphasizing implementing high ICT use in after-sales service and support in countries with high uncertainty avoidance.
Hofstede (2000)	The paper investigates the specific attributes of countries that influence ICT adoption speed. Findings show that cultural variables (individualism and uncertainty avoidance) can be used to predict the ease and speed of changes. Cultures of high uncertainty avoidance are slow of adopting new technologies.

This strand of research regularly produces findings that imply causality or what is also referred to as a “binary distinction” (Slack & Wise, 2002; Winner, 1977). According to Slack and Wise this research fails on at least two counts. First, a binary (causal) distinction cannot adequately explain the complex nature of everyday discourse and ICT use, and second, the binary is not capable of explaining the theoretically-acknowledged reflexivity between cultures and ICTs. By reflexivity we mean that the relationship between organizational cultures and ICTs is not simply causal. Either one can cause changes in the other (Gudykunst & Ting-Toomey, 1996, Orlikowski, 1992), because technology is part of culture and visa versa (Latour, 1996; Slack & Wise, 2002; Winner, 1986). Furthermore, neither cultures nor ICTs remain constant (Hofstede, 1991). Hence, more empirical research is needed to explain this reflexive and dynamic relationship (Slack & Wise, 2002; Stohl, 2001).

So far in this paper we have identified three problems or motivations to study the relationship between ICT and culture: (1) theories of ICT practice/use lack cultural sensitivity, (2) theories often propose causal relationships instead of dynamic and reflexive ones, and (3) there is a practical need to understand more about ICT use across national boundaries. This study, grounded in Hofstede’s theoretical framework, provides a reflexive comparison between two countries. Using this framework, we seek to ground this study in theory and build upon that theory.

Cultural Frameworks

Acknowledging the existing body of research, some authors claim that cross-cultural research on ICT use “remains in a state of infancy,” because of the frequent disagreement concerning how to define “culture,” and epistemological differences between researchers (Straub, Loch, Evaristo, Karahanna, & Strite, 2002). Half a century ago, Kroeber and Kluckhohn (1952) found more than 160 definitions of culture. Since then, the number of definitions has mushroomed to approximately 400 (Ferraro, 1994). It’s not our aim to review this battery here (See Gudykunst & Ting-Toomey, 1988; Hall, 1976; Merchant, 2002; Stohl, 2001; Trompenaars & Hampden-Turner, 1997 for reviews). Most of the frameworks focus on averages or norms of the cultures’ systems rather than on precise descriptions (Stohl, 2001). The studies attempt to represent approximate

expected behavior by individuals in a specific culture, while conceding that everyone in that culture does not act alike. Indeed, variations within single cultures are often greater than across cultures (Hofstede, 1991). In general, however, one can say that, within a group of people, there are some precepts that influence the behavior of the people involved.

After more than 20 years of use, Hofstede's dimensions of national culture are often used by academics, consultants, and management groups to help sort out and understand differences between national cultures. Hofstede (1980) presented a model of national culture—based on a survey of more than 50 countries involving more than 120,000 respondents—that posited four dimensions: Power Distance Index (PDI), Uncertainty Avoidance Index (UAI), Individualism/Collectivism (IDV), and Masculinity/Femininity (MAS). More recently, a fifth dimension, Long vs. Short-Term Orientation, was added. We don't include this dimension here because it was introduced to account for a missing "eastern" perspective in the original four dimensions. The original dimensions have been faulted for portraying only a "western" way of thinking (Hofstede, 1991). While Hofstede's system is certainly not perfect, several studies provide supporting evidence for its dimensions (e.g., Fernandez, Carlson, Stepina, & Nicholson, 1997; Ronen & Schenkar, 1995; Sondergaard, 1994; Straub, 1994) and use them to account for empirical observations (e.g., Earley 1993, Straub, 1994. See also Hofstede, 2001 and Sondergaard, 1994 for reviews of follow-up studies, and Smith, 2002 for an in-depth analysis and critique).

Hofstede (1980) asserts that central tendencies in a nation are replicated in their institutions through the behavior or practices of individuals. As Tayeb (2001) argues, "The main advantage of breaking down culture into its constituents characteristics is that it facilitates comparison across cultures; one looks at the same trait and observes similarities or differences among the nations under investigation or even notes its absence from some culture altogether" (p. 93). Similarly, Hofstede (1991) argues that his framework "can serve to explain and understand observed similarities and differences between matched phenomena in different countries" (p. 14).

The present study uses Hofstede's (1980) model for three reasons. First, it has been shown to be stable and useful for numerous studies across many disciplines. Second, his research and arguments are compelling to organizational researchers because, even before empirical testing, links can be seen between his four dimensions and many aspects of international organizational behavior (Sackman, 1997). Included are familiar constructs such as decision-making, political risk (found in Hofstede's uncertainty avoidance index), leadership, authority relations (found in Hofstede's power distance index), the importance of work goals and interpersonal relations (found in Hofstede's masculinity dimension), and motivation and compensation systems (found in Hofstede's individualism dimension). And third, Hofstede's framework explicitly links national cultural values to communication practices and communication practices using ICTs are central to our study (Merchant, 2002; Samovar, Porter, & Jain, 1981; Stohl, 2001). Furthermore, Hofstede's work and conceptualization of culture has been used by many researchers to explain the role of communication using ICTs in the workplace (e.g., Cagiltay, 1999; Dafoulas & Macaulay, 2001; Kim & Bonk, 2002; Rathod & Miranda 1999; Straub et al., 2002; Vogel, Davison, Shroff & Qureshi, 2001).

Hofstede's Four Dimensions of Cultural Differences

Hofstede's original study had over 120,000 workers from more than 50 countries respond to a total of 33 questions and statements, such as "Have sufficient time left for your personal or family life", "Have considerable freedom to adopt your own approach to your job", and "Have little tension or stress on the job." These were answered on a five point scale – ranging from "of utmost importance" to "of very little or no importance." Respondents were also asked to pick one

out of four possible “manager types” in various questions related to preference. (See Hofstede, 1980, Appendix 1 for the complete questionnaire). Hofstede found consistent differences between matched groups of workers from different countries based on value scores. Both correlation and factor analyses were carried out on each country’s mean score based on the 33 questions. In general, statistical analyses, coupled with theoretical reasoning, produced four dimensions of national culture differences (Hofstede, 1980). More specifically, the Power Distance Index (PDI) and Uncertainty Avoidance Index (UAI) were found through an eclectic analysis of the data, by correlation analysis and theoretical reasoning, while the dimensions of Individualism (IDV) and Masculinity (MAS) were identified through factor analysis. A final factor analysis of all the data combined was carried out to fit the picture of the four dimensions equally (Hofstede, 1980). These differences and similarities provide the impetus for our study. Table 3 shows the results of the study for just two of the various countries in his study.

Table 3. Norwegian and U.S. scores on Hofstede’s 4 Dimensions

Country	Power Distance	Uncertainty Avoidance	Individualism/Collectivism	Masculinity/Femininity	Total
U.S.	40	46	91	62	157
Norway	31	50	69	8	158
Range (IBM Study)	11-104	8-112	6-91	5-95	

To best understand how Hofstede’s framework might relate to ICT use, we provide a description of each dimension from which we build to our propositions. We use Hofstede’s claims and other empirical findings about cultural differences as a predictor of what our data will show. We then describe the current study. In the findings section we will describe how our data compares to Hofstede’s predictions.

Power Distance (PDI) and ICT

Hofstede’s first dimension (1991), the Power Distance Index (PDI), reveals dependence relationships in a country. More precisely this is the extent to which less powerful members of a society accept unequal power distribution. Small power-distance countries, such as Norway (extremely low) and the United States (moderately low), show limited acceptance of power inequality and less dependence of subordinates on bosses. They also show a preference for consultation and cooperation, that is, interdependence between boss and subordinates. In low PDI cultures, subordinates and superiors consider each other as essentially equal; “the hierarchical system is just an inequality of roles” that is established for convenience (Hofstede, 1991, p. 36). We should therefore expect to find examples of close working relationships between boss and subordinate, but also examples of assertive behavior by subordinates, such as defining their own work tasks.

Furthermore, attitudes toward ICT use will be enhanced by a decision and implementation process that increases users’ sense of participation in the choice of new ICTs (Veiga, Floyd & Dechants, 2001). We should therefore expect to find evidence of resistance in situations where new ICTs, and policy pertaining to their use, are implemented without the participation of members below top management.

Relating the low PDI more directly to ICT use, we expect high usage of rich media such as face-to-face, since there are few communication barriers based on status or power issues. This

encourages frank, informal contact between boss/subordinate (Jarvenpaa, Rao & Huber, 1988). Furthermore, low PDI cultures are also likely to use “lean media” in a number of situations just for efficiency. Along the same lines, contrary to high PDI cultures, where emphasis is put on showing one’s identity and thereby revealing one’s status, in low PDI cultures people are more likely to mute their identity since it has lesser bearing in the communication process and the outcome (Ho, Raman & Watson, 1999).

Uncertainty Avoidance Index (UAI) and ICT

The second dimension in Hofstede’s original conceptualization is labeled the “Uncertainty Avoidance Index” (UAI), which Hofstede defines as the “extent to which the members of a culture feel threatened by uncertain or unknown situations” (Hofstede, 1991, p. 113). Norway and the United States are labeled “moderately low” in this dimension, indicating their ability to accommodate ambiguity and uncertainty in the workplace.

In cultures with low UAI, there is less need for predictability and written and unwritten rules to guide work tasks. Due to less rule-dependency, these cultures are more trusting than their counterparts (De Mooij, 2000). This may lead to early experimentation with, and adoption of, new ICTs, and the use of multiple technologies in their working tasks (Maitland & Bauer, 2001; Veiga et al., 2001). Also, employers will seldom try to impose company rules on ICT usage, and if they do, it’s likely that people will challenge or break such rules for pragmatic reasons (Veiga et al., 2001). Furthermore, these countries are normally heavy users of ICTs, especially “lean” media, both in the workplace and at home. Both the freedom and the lack of structure on the Internet make it a good fit for low UAI cultures, and we would therefore expect to find examples of heavy use of multiple ICTs (De Mooij, 2001).

Hofstede asserts that the level of uncertainty and ambiguity found in a culture profoundly affects how institutions are organized and managed (Hofstede, 1983). Consistent with this logic, low UAI will therefore likely affect how individuals choose media for their communication tasks (Straub, 1994). For ICT usage we should therefore expect to see individuals using multiple channels for somewhat similar tasks as well as different ICTs in combination. In situations of high ambiguity and uncertainty, on the other hand, we would therefore expect to find great variation in what ICTs are chosen, due to a lack of strict patterns and individual differences. As early adopters of ICTs, both cultures should display evidence of innovative and advanced usage patterns (Maitland & Bauer, 2001). Yet another aspect of this dimension deals with the age differences of users. In cultures with low scores, older people, often higher up in the company hierarchy, are more apt to leave tasks and great responsibility in the hands of younger workers (Hofstede, 1980). This is congruent with Hofstede’s listing of specific characteristics of low UAI cultures, where he found that managers often depend on expert opinions from workers lower down in the hierarchy. In contrast with high UAI cultures, managers don’t need to be experts in the field they manage (Hofstede, 1991).

Individualism (IDV) and ICT

Hofstede’s (1991) last two dimensions use a scale measure, and for this particular dimension countries are either labeled “individualistic” or “collectivistic.” While recognizing that most societies have some characteristics of both, we base our definition on Hofstede’s original conceptualization. “Individualism” pertains to societies where individual ties are loose and everyone is expected to look out for themselves and their family. In “collectivist” societies, on the other hand, people are integrated at birth into strongly cohesive in-groups, and group loyalty lasts a lifetime. In the organizational context, individualism or collectivism emphasized in a particular

culture has a direct bearing on behavior. In Hofstede's study, the United States scores highest (most individualistic) of all nations on this dimension, while Norway scored moderately high.

The notion that "time is money" is prevalent in individualistic countries, causing individuals to manage their time tightly (Trompenaars & Hampden-Turner, 1997). Another time-related feature is their ability to schedule and handle several tasks either simultaneously or sequentially. As Veiga, Floyd and Deschants (2001) found, "in individualistic cultures new IT will be more likely viewed as useful when it is perceived as enhancing the performance of the individual."

Since such cultures emphasize personal accomplishments and productivity, the time and effort required to establish or maintain a personal relationship are often compromised to get the job done. In short, in individualistic societies, the task will normally prevail over any personal relationship (Hall, 1976; Walls, 1993). Relevant ICT use and communication efforts are displayed by searching and querying new information sources like company Webpages or through the participation in Newsgroups. In an individualistic culture, people therefore seem to be more innovative and trusting in exchange relationships with external parties (Van Birgelen et al., 2002).

Masculinity (MAS) and ICT

Although Norway and the United States score similarly on the three previous dimensions, they show a stark contrast on the last one – the Masculinity Index (MAS). In broad terms, "masculinity" pertains to societies where social gender roles are clearly distinct (i.e., "masculine" countries value assertiveness and focus on material success, while "feminine" countries value modesty, tenderness, and quality of life (Hofstede, 1991). Given the value placed on modesty in more "feminine" cultures, Triandis (1995) asserts that individuals from such cultures don't like to stick out – that is, be unique or conspicuous —unlike the more assertive and career-seeking individuals found in countries like the United States. The "live in order to work vs. work in order to live" dichotomy is often used to illustrate the fundamental difference, but we believe further distinction is in order. The United States scores moderately high in this dimension and is thus labeled "masculine," while Norway scores extremely low and is thus very "feminine."

De Mooij (2000) found that feminine cultures don't restrict their need for quality of life to the privacy of their home alone, but extend it into the workplace as well. Leisure and personal activities, such as reading news and watching television, may be tolerable at work. This is not so in masculine cultures, where a stricter task orientation prevails. We should therefore expect to see differences between the U.S. and Norway with regard to distinctions made between work and leisure activities in the workplace. Even if feminine cultures are likely to draw clear boundaries between the workplace and the private sphere, workers in those cultures are prone to take work home just to be with their families. Hofstede's (2000) findings support this assertion and claim that one-way devices (e.g., fax) will be more prominent in masculine countries, while two-way devices (e.g., cellphones) are more likely to be adopted in feminine countries, as they enable contact even after regular working hours.

Research propositions

Based on the above descriptions of Hofstede's four dimensions, related to ICT practices, we expect to find both similarities and differences between the U.S. and Norway. More specifically, we offer the following propositions:

PDI: Considering that Norway and the U.S. differ by only 9 points on Hofstede's 93-point scale, we expect many similarities and thus propose the following: Using Hofstede's Power Distance Index, ICT use in Norway and the U.S. will be similar.

UAI: Since both Norway and the U.S., are within 4 points (out of a 104-point scale) of each other, we expect them to behave almost identically, and thus propose the following: Using Hofstede's Uncertainty Avoidance Index, ICT use in Norway and the U.S. will be similar.

IDV: Despite both countries being categorized as individualist, there is a 20-point spread (on the 85-point scale) between them. This suggests that there are likely to be some differences, and thus we propose the following: Using Hofstede's Individualism Scale, ICT use in both Norway and the U.S. will exhibit individualist tendencies, but the U.S. will be more individualistic.

MAS: We expect to find clear differences in the masculinity dimension, given the stark contrast between the U.S. and Norway. Norway scored 5, while the U.S. scored 62 on a 90-point scale, and thus we propose the following: Using Hofstede's Masculinity Scale, ICT use in Norway will exhibit feministic traits and ICT use in the U.S. will exhibit masculine traits.

Method

This study builds on a grounded theory analysis of ICT use (Stephens, Browning, Sørnes, Schmisser, & Saetre, 2002). While the original research was an empirical theory-building piece, the categorized data that resulted from this constant comparative analysis (Glaser & Strauss, 1967) serves as a useful database and search tool for details in our data. Strauss and Corbin explain that qualitative research is useful for giving "intricate details of phenomena that are difficult to convey with quantitative methods" (1990, p. 19). Since we rely on the original categorization scheme as our search tool, we will provide some details pertaining to the coding and analysis process.

Participants

As described earlier, national culture can only manifest itself through verbal and/or non-verbal behavior of individuals in a society, as there is no way to query or probe into the collective unconscious values of an entire culture (Hofstede, 1991). Our sample consisted of people in various knowledge-worker roles who worked for organizations based in Norway and the United States. The industries represented were diverse in size and type. They included e-learning, farming, fish-farming, higher education/R&D, medicine, law, software-production, telecommunications, semiconductors, oil and gas, and governmental agencies. We used a judgment sampling method whereby individual respondents were chosen based on their experiences, ability to reflect, and ability to articulate the information solicited (Morse, 1991). They consisted of a cross-section of users from different functional areas, ethnicities, professional and organizational tenure, and gender. Finally, we considered the nature of their work tasks and proactively sought experienced and advanced ICT users.

The most common strategy found in cross-cultural research is to compare groups from very different perspectives (e.g., Japan vs. the U.S.). We have chosen here to compare two rather similar cultures, each possessing universal education, social welfare systems, and institutions dominated by Judeo-Christian thinking (Aukrust & Snow, 1998). Furthermore, we have chosen samples that are similar on several key variables that are often concerns in studies such as ours. Both Norway and the U.S. have a similar penetration of ICTs, and both have many expert users. The diffusion of advanced ICTs is among the highest in the world in Norway and the United States (Bauer, Berne & Maitland, 2002). Actual use of the Internet is far higher in Norway (and the other Nordic countries) than in any other European country, and is at approximately the same level as in the U.S. More than half the population in these countries uses the Internet on a daily basis, which is likely to have some impact on communication patterns and lifestyles (Lundby, 2002). According to Henten and Kristenson (2000), these two countries can be seen as societies

that are similar in having advanced information societies. These similarities serve to lessen the often confounding effects of differential digital-divide issues and user-experience levels, thus giving us the benefit of not having to account for such differences at the outset or as a limitation to our study.

Data Collection

The data were collected over a two-year period, from the fall of 2000 through the fall of 2002. During this time, four researchers conducted 72 individual interviews—36 in the U.S. and 36 in Norway. Each interview lasted 45–90 minutes and was audio-recorded. To collect the data, we used semi-structured, in-depth interviews. Because this research involved many sites and multiple interviewers, and because we wanted to maintain cross-case comparability (Hofstede 1991; Miles & Huberman, 1994), we felt it especially important to use a similar format for all our interviews. To ensure this consistency, we created an interview guide based on Spradley’s (1979) “grand tour type” design. This approach focuses on relaxing participants during the data-collection process, and it also invites detailed responses from them. The interview guide began with questions focused on how participants used ICTs in their daily work. From this point, questions moved on to a more interactive level by querying interviewees about their ICT use when working with others. The recordings of these interviews, once transcribed, resulted in over 2,000 pages of text. The entire Norwegian data set was translated into English by the two Norwegian researchers.

Data Analysis

As previously mentioned, this study used constant comparative analysis to enable the researchers to modify their analyses as further data are gathered (Charmaz, 2000; Glaser, 1978, 2002; Glaser & Strauss, 1967). Our process consisted of two main steps: (1) incident identification, and (2) categorization. First, we marked individual units of data—called “incidents”—ranging from single sentences to short paragraphs. The incidents were labeled; then combined, and duplicates were removed. The process resulted in 4,972 individual incidents. All of these incidents were then sorted into a category system Glaser (1978). Once again, three of the four researchers participated in this focused coding (Glaser, 1978). Since the three categorizers didn’t always agree, a final categorization was undertaken. In this process, two of the four researchers independently categorized the entire data set. Then, by working together to resolve any disagreements, they achieved a doubly categorized data set that resulted in 59 categories. These final 59 are the categories that organize the raw data used in the current study.

Our study takes advantage of the 59 category system as it serves as a database on ICT use. Furthermore, the fact that each raw code (incident) was attributed to either a Norwegian or an American enables us to sort and search between the two countries. As we organized our data in an Excel spreadsheet, we were able to sort our data for this purpose. To illustrate how the data informs Hofstede’s framework, we selected narratives from the interviews. We used the researchers’ intimacy with the data, as well as searches of our database, to select the narratives used for analysis in this paper. This is consistent with Glaser’s (1978) view that researchers may flexibly draw on and construct frameworks based on the theoretical leads suggested by their data. Similarly, Strauss (1970) admits that while the emphasis in the 1967 monograph with Barney Glaser was theory generation, its analytical style could also be used in the context of previously developed theory—as long as it had been carefully grounded in research. In our findings, presented in the following sections, we describe what we learn from our narrative analysis of ICT use.

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Findings

Based on individual reports of ICT use from both Norwegians and Americans we compared our findings with existing differences and similarities in Hofstede's four cultural dimensions. Overall we found very few differences between Norway and the United States, as Hofstede did, in Power Distance (PDI) and Uncertainty Avoidance (UAI). But on the last two dimensions—Individualism (IDV) and Masculinity (MAS)—our findings differ from those of Hofstede, as we found that the U.S. and Norway look similar on these two dimensions as well.

Power Distance (PDI)

Managers and subordinates work together. Our findings for this dimension indicate high concurrence with Hofstede's general description of low (Norway) and moderately low (U.S.) PDI. Hofstede conceptualizes equality between superiors and subordinates as a trait of low PDI, and we found numerous accounts of close working relationships between these organizational groups. The following comment, an example from the Norwegian dataset, illustrates how this mutually dependent relationship between boss and subordinates is solved in a competitive intelligence team:

We have intentionally placed ourselves in a star formation around a circular table at work where we have our computers and a little personal workspace. The whole idea is to have visual contact and the conversation flowing, as this is valued by everybody in the group.

This example consists of a four-person group, where one of them is the manager. This respondent further explains, "The ability to interact and communicate throughout the day is essential to what we do ... team members depend on each other for reliable information." We see here a mutual dependency between boss and subordinates in their effort to produce timely competitive intelligence on their opponents.

Subordinates take initiative. Another attribute of low PDI is that work tasks and ICT preferences may be initiated by the subordinates themselves and not just by their bosses. A Norwegian interviewee demonstrates that there is a mix between the two: "The tasks may be self-selected or assigned by top-management—usually a 40/60 split in that order." A U.S. manager explains that she prefers to use email for everything, but she also recognizes that her employees working with customers need to operate in a face-to-face environment. She explains this by saying, "The office needs diversity. It's boring if everyone uses ICTs the same way."

Power differences still exist. Just because attempts at leveling the status differential are made, we have examples demonstrating that power differences still exist. The following two examples from both countries show how the interviewees are less concerned with quality when communicating with subordinates than they are when communicating with superiors or colleagues of equal rank. A Norwegian professor said: "When I communicate with students I have a certain authority, right? ... I can sit and write anything and hit Return immediately. But when I communicate with colleagues, then I am more thoughtful on what I am actually writing." A U.S. consultant, meanwhile, said the following about correcting spelling errors when using email: "If it's to anybody who is more senior than me, I will always fix it." While independence is valued in both cultures, giving employees too much freedom during work hours can backfire. In the following example, an employer recalls finding out that one of his employees spent too much time on the Internet chatting (ICQ) during work hours: "I told her to cut it out, so to speak ... she didn't talk to me for a few days, but she stopped doing it." Even in low PDI cultures, direct commands occasionally shape behavior.

Include employees in decision-making. Members of low PDI cultures feel strongly about making their own decisions concerning ICT use. Likewise, when decisions about ICT implementation are

discussed at the organizational level, they like to be involved. The following example from the Norwegian dataset demonstrates this preference: “The College has purchased a system that forces you to use a particular logic, and the decision to buy the system was made independent of what we as faculty think of such a system.” Similarly, a U.S. respondent finds her company’s restrictive policy on voice mail to be very inflexible, and would like more latitude: “My current company is a very voicemail kind of culture.” She describes this informal policy as something that has essentially become a part of the corporate culture. Basically, our interviewees demonstrated their desire for inclusion by complaining about systems that had been adopted without their input.

Anonymity. Contrary to high PDI cultures that emphasize showing one’s identity and status, the opposite is true for low PDI cultures like Norway and the United States. Here, power, gender, and race have little impact, and information [in Newsgroups] is shared freely. One Norwegian interviewee and frequent user of Newsgroups has wondered about what kind of people actually participate, and concludes that they are probably “enthusiasts, idealists, people who probably live in front of the screen —possibly students, university people, and those so-called nerds in the basement.” He explains that Newsgroup participants do not even list their titles, and they are judged on the merits of their responses to posted questions. Even in this open environment, though, individuals vary in their preferences for anonymity. Some people prefer to disguise their identity, while others give the matter no weight. One interviewee from the U.S. said, “The younger generation uses nicknames to identify themselves, but older people use their real names.” The younger individuals may want to conceal their identity for one of two reasons: (a) they don’t want to expose their ignorance on a topic, or (b) they find that nicknames make digital communication more informal and accessible.

Overall, the findings on how ICTs are used in the U.S. and Norway support Hofstede’s claim that both countries are low with respect to Power Distance. The examples illustrate close working relationships between superiors and subordinates, yet also suggest some concern for power issues. There is evidence in both countries that they want to be involved in decisions about new technology adoptions. Finally, we see that status and identity issues are not a big concern and there is variation in how these are communicated.

Uncertainty Avoidance (UAI)

ICT use can be considered a rudimentary activity for reducing uncertainty and ambiguity. Since this is a study of high-end users about how they use ICTs to search for and communicate information, it’s not surprising that much of our data fell into this category. In fact, most of our 59 categories were found to inform this dimension to some extent. Norway and the United States are both moderately low on UAI, and out of all four dimensions this is where one would expect the nations to be most similar.

ICTs well diffused. ICTs such as the Internet are normally well diffused in low UAI cultures, as they represent personal freedom to choose various media without adhering to rigid rules and structures. Our data suggest evidence of this, as most of the interviewees used multiple channels for similar tasks and used different ICTs in combination. A Norwegian respondent said that his usual approach to getting new customers was to (a) search for information on the Web, (b) email the companies identified, (c) phone them to get more personal contact, and (d) arrange a face-to-face meeting. In the same way, a U.S. interviewee made the following remark when talking about staying in touch with her communication partners: “a combination of everything [ICTs] is absolutely essential.” These examples show how ICTs are used sequentially and in combination to reduce uncertainty.

UAI cultures are expected to be innovative and display advanced use of ICTs. We would therefore expect to find evidence of early adoption of new ICTs, coupled with the desire for new ICTs. Our dataset includes examples of how new ICTs may enhance one's communication efforts. While talking about the limitations of using a laptop computer during meetings, a Norwegian said, "There is no doubt that an overgrown Palm [Pilot] would have been incredibly practical." Another Norwegian expressed the desire for a more efficient searching mechanism on the WWW: "I would like a search engine that gave about 20 highly useful links instead of 3,000 hits that just matched my search keyword. I would also like to see a system or tool that checked for quality." A U.S. respondent, who is in sales, would like to get information about people accessing their WWW pages: "A tool that would mine data from people visiting our Website would be helpful—a way to figure out who they are." The ability to figure out who visits Websites would clearly reduce the environmental uncertainty facing the organization and enable its employees to better tailor their sales approach. These examples illustrate the inclination in both countries to think innovatively and find better ways of reducing uncertainty through ICT use.

Rules are broken. Another area deals with compliance and non-compliance with organizational policies on ICT use. Working off of Hofstede's conceptualization, we expected that members of low UAI cultures would be more likely to deviate from company policy. A Norwegian respondent talked about being part of a company policy "mutiny" by implementing his own solution: "There was a tremendous uproar, of course, but we were at the mercy of the functionality of this software. It had all these problems that we would not accept, so no one was motivated to start with it." Similarly, a U.S. respondent talks about "fooling" the online meeting-scheduling system. While company policy required full disclosure of available time slots for meetings on the online calendar, she was able to manipulate this: "If I need to be at home I'll just put myself *out* of the office." Another Norwegian respondent also broke company rules by downloading software off the Internet, saying, "We have a policy that individuals are not supposed to download and install such things, but we do it anyways. Sometimes when you need something right away, it is very tempting just to download it from the Internet." These examples demonstrate employees' willingness to break rules in an effort to customize or improve existing systems. As illustrated by the examples above, our data indicate that both our Norwegian and U.S. respondents were saying very much the same thing.

Tasks are delegated. The last set of findings concerning delegation is closely linked to descriptions of low PDI cultures as well as low UAI. Unlike cultures with high UAI, where managers are expected to be experts in the field they manage, our data shows that tasks are often delegated to subordinates. The following two examples exhibit low UAI action. A U.S. respondent talks about how the task of updating a course Web page is delegated to teaching assistants: "While the professor is off doing research or teaching the class, they expect the assistants to use the technology—to put content up there and update the grade book." A Norwegian manager also turned to his subordinates when faced with a problem that required information searching, explaining, "I am more inclined to go ask somebody across the hallway than searching for information on the Internet [myself]."

It's not surprising that the U.S. and Norway are similar in the UAI dimension, because both countries have embraced new ICTs. In prior studies this dimension has been explored heavily as a predictor of likelihood of ICT adoption. These findings suggests that when allowed access to many ICTs, low UAI countries will experiment with using them in sequence and even break existing rules to accomplish tasks.

Individualism (IDV)

Our findings in this dimension demonstrate both concurrence with and differences from Hofstede's conclusion. Our data shows characteristics of both individualism and collectivism in both countries. Actually, it was difficult to tell if comments in the interviewees came from a Norwegian or an American because the accounts often sounded so similar. In individualistic cultures, ICTs are viewed as useful when they enhance the performance of the individual. This is especially observable in the dataset as respondents from both countries display high consciousness about using these ICTs efficiently. A very strong account of this was made by a U.S. respondent who explained that technology helps him look good and accomplish much more in less time. A Norwegian interviewee found out that some of his communication partners did not answer emails in a timely fashion, so the telephone was more appropriate: "I almost never use email with those people anymore—I know there is no point. I can send one email after another and I don't get an answer anyway." These examples demonstrate how efficiency is determined by each individual's timeliness of responses.

Our data also shows that individualism is fostered by ICTs in that synchronous communication is not required for either individual action or learning to occur. Using the Internet as a tool for learning can take many forms, ranging from downloading tutorial documents to direct contact with individuals (strangers) through email or various discussion forums. A comment by a Norwegian respondent illustrates the individualist nature well: "I have not been to a course in 10 years, and everything I have learned I have taught myself, via the Net for the most part." Similarly, a U.S. respondent talks about the value of the Internet for staying abreast of the constant need for new knowledge in her job: "Using the Internet for research just makes me smarter." This focus on what "me" the individual gets from the Internet clearly demonstrates individualism.

Collectivist tendencies. The learning process can also be very efficient and fairly collectivistic when using ICTs such as the WWW. A Norwegian respondent makes this point well: "Colossal numbers of people around the whole world who have encountered the same issues have published solutions on the Net someplace or another. You don't have to reinvent the wheel again." Correspondingly, a U.S. respondent states that the Internet is powerful because it holds "the wisdom of hundreds of millions of people." Yet another example by a Norwegian respondent emphasizes this point: "I just like the idea of posting a question [in Newsgroups] before you leave work, and the next day you can read some answers. It seems like there is always someone out there that is willing to lend a helping hand." Although these statements display high collectivism, we found that most of our respondents draw more from the Internet than they contribute themselves. In other words, individuals are focused on their own personal need for information. This seems to be a mix of individualistic and collectivist actions since true collectivism would dictate group loyalty and reciprocal contributions.

As demonstrated, while the dominant characteristic seen here is individualism, both cultures also display collectivist values. Many of the comments provided here describe the value of shared information. While we expected to find greater differences in this dimension, based on Hofstede, the findings are interesting with respect to the similar comments made by the interviewees representing both cultures.

Masculinity (MAS)

The "live in order to work (U.S.) – work in order to live (Norway)" dichotomy is ingrained in most of Hofstede's writings on MAS. Given this clear dichotomy we should therefore expect to find evidence of such differences in our data. We did not. In fact, we found the Norwegians to be

very masculine (e.g., assertive, desirous of challenging work tasks, eager for individual recognition at work) and the Americans to display feminine traits at times.

Assertive behavior. As expected, we found numerous accounts demonstrating assertive and proactive information-seeking in the U.S. dataset. But, more surprisingly, we found similar behavior in the Norwegian dataset. One plausible explanation for this is extensive deregulation and privatization during the last decade, especially in the telecommunications sector. As one respondent put it, “It’s all about competitive ability in a market that is becoming big and aggressive—even in Norway.” Another Norwegian interviewee was in charge of setting up an office abroad, and he told us his strategy for recruiting personnel: “We were lucky and managed to recruit the trading manager from our largest competitor; he brought a mountain of networks and competencies with him.”

Modesty. As conceptualized by Hofstede, modesty and resistance to “sticking out” are characteristics of low masculinity; however, we found examples illustrating the opposite in the Norwegian dataset. A respondent working with a competitive intelligence team offered the following answer when asked how he managed to provide his boss with competitive information in a timely fashion: “I could probably put together a 30-page PowerPoint presentation—on anything—and have it completed by tomorrow.” The example illustrates articulated high self-esteem, which is unusual in Norway, due to the national emphasis on modesty and toning down of one’s own accomplishments.

Company time for leisure activities. We also found numerous accounts in the U.S. dataset of femininity – the desire by people to “work in order to live.” This contradicts the notion that a strict task orientation prevails in masculine cultures. The following demonstrate how U.S. respondents use company time for leisure activities. One U.S. respondent finds the introduction of Internet-related services into the workplace to be quite paradoxical: “Ironically, companies provide access to the Internet, and employees use it on company time to get a new job or retreat from work.” Another U.S. respondent talks about the extensive use of virtual communities (e.g., Yahoo discussion groups) on the Internet for pursuing personal interests in politics, music, and arts: “We also use the Internet to actually download the compressed form of bootlegs.... We burn it, spread it all over ... that’s the kind of things we use the technology for—to communicate with people and transmit the music.” While some of our respondents felt comfortable talking about their personal ICT use, often on company time, we realize that others would feel uncomfortable revealing such habits.

Work/home distinction. The following examples illustrate that there is no clear distinction between work and private sphere. One interviewee said: “My work is also my hobby, so I don’t use my computer and Internet any different at home. It is hard to differentiate between what’s work-related and what isn’t.” Another Norwegian example also illustrates this blurred boundary: “I have free time, of course, but some periods in the project are so hectic that I must prioritize it before other free- time activities.” We found numerous accounts of this in the U.S. dataset as well. For example, one respondent said, “I extend the day to where I work usually an hour in the morning, an hour or two at night, and then probably about two, three hours on the weekend.” Evidence of masculinity in the United States based on these criteria wasn’t surprising; however, the Norwegian data also prominently displayed this as well.

Synchronous ICTs. Our data concerning the use of cellphones was prominent as interviewees in both countries talked about the value of individuals to be “available” by cellphones even after regular working hours. An example from the Norwegian dataset illustrates this: “The motivation for giving employees cellphones is that we have a clear policy that when the cellphone is on, we can call them anytime, day or night.” While this example illustrates masculinity, we also found numerous accounts of cellphone use for social support, hence low masculinity. A U.S. respondent

said the following when asked about the impact of the September 11th terror attack of the World Trade Center: “The cellphone business went in the ‘pink’ right after that; because I think people realized how much they want that ability to be in touch.” Another U.S. interviewee finds great value in using cellphones to stay in touch with her kids while at work: “I think it is a security for the parents because they have that direct link to their child, and not only can they speak directly, but they can leave a message.” Accounts of cellphone use for non-work-related communication are also found in the Norwegian dataset. The following example illustrates the consequences of giving employees free cellphones, which includes the possibility of sending SMSs (Short Messaging System):

It can be practical to send text messages to people, but we have employees who send 1,000 text messages a month on company cellphones. One thing is that it takes time to send 1,000 text messages, but it also costs a great deal of money.

Furthermore, we expected to find a higher display of cellphone usage in Norway due to a much higher penetration than in the U.S. This was not so, as there were similar numbers from Norway and the U.S. in this category. This is probably accounted for because we selected advanced ICT users for interviews from both countries.

U.S. shift toward femininity. Our data includes responses to the Dot.Com Crash and September 11th, especially in our second-year dataset, based on direct questions on the impact of these two events. While Norwegian respondents for the most part answered that it had no impact on their business or work tasks, many also reported that they spent more time reading news on-line. Some interviewees also reported less travel, especially to the United States, and more use of ICTs such as videoconferences for meetings. Respondents with business relations or connections with the United States reported that they used ICTs to express moral support, especially after September 11th. Most of our respondents from the United States reported a substantial impact of these two events on their business practices—more specifically, their ICT usage. One respondent reported less use of his computer: “The computer stopped being the main highway for communication, and more focus was put on restoring the social fabric.” Another interviewee reported how on-line communities on the WWW changed after 9/11:

It was very interesting to me to be able to read and see and hear perspectives from people who I had never met and will never probably meet ... I have noticed that since then it has had the same effect on the Web that it had on the whole nation. We had for a while there a kinder, gentler Web.

Another respondent reported the following effect of the dot.com crash: “People were walking around with their cellphone, their pager – ‘I’m so busy, I’m so busy, I’m so important, I’m so important ...’ Now people have slowed down at least 20%.” Based on Hofstede’s findings on differences between Norway and the United States in the MAS dimension, we expected our findings to echo this more clearly. However, our findings indicate that the United States demonstrates feminine ICT behavior and Norway masculine ICT behavior.

Discussion

We interpret these findings from the stance of how they are capable of potentially changing how national culture appears in local circumstances. As demonstrated, ICT practices can be taken as an indicator of culture because ICTs are a part of culture (Hofstede, 1991; Schein, 1985). While we acknowledge counter examples to our findings in the previous section, in all four dimensions, this section will focus on the predominant tendency in the findings.

The findings for the first two propositions show that ICT use in the U.S. and Norway reflects Hofstede’s findings for Power Distance (PDI) and Uncertainty Avoidance (UAI). This suggests

that ICTs do in fact mirror the status differential between superiors and subordinates. These findings also suggest that in cultures where ICTs are well diffused, they are used in many different ways. The willingness to accept uncertainty (UAI) opens the door for new appropriations of individual ICTs and sequences of their use. These new appropriations can be explained using Orlikowski's perspective on technologies in practice. Her practice lens "focuses on emergent technology structures enacted in practice rather than embodied structures fixed in technologies" (2000, p. 408). She uses a structuration approach to understand how repeated interaction with technology creates "sets of rules and resources that are (re)constituted in people's recurrent engagement with the technologies at hand" (p. 407). It is quite possible that in cultures with moderate to low UAI, as in this study, there is a willingness to experiment with ICTs rather than simply accept the features embedded in their original design. But since there is a recursive relationship between ICT use and culture, this also suggests that changes in either variable can affect the PDI and UAI dimensions in the future.

In propositions three and four, IDV and MAS, we expected to find differences between Norway and the United States in ICT use based on Hofstede's findings. But we found that ICT use looks almost the same on these dimensions regardless of national culture. As mentioned earlier, the U.S. scored the highest total of all Hofstede's studied cultures with respect to the individualism dimension. While our data still suggests that the U.S. is highly individualistic, we also see evidence of collectivist behavior, especially in how email and the telephone are used to facilitate personal relationships. On the other hand, Norway was expected to exhibit more collectivist tendencies than the U.S., yet on this dimension, the U.S. and Norwegian interviews look almost identical. Specifically, Norwegians are equally concerned with high productivity and task—strongly individualistic characteristics—and both countries use ICTs in similar ways. There is also a strong focus in both countries on using the Internet for just-in-time learning—that is, learning when a single person needs the information. This is highly individualistic and reflects a similarity between cultures in how the responsibility for learning now falls squarely on the shoulders of the individual.

While there was only a slight difference expected between Norway and U.S. on the IDV dimension, an even larger discrepancy was expected in the MAS dimension. Here there was an expected 54-point spread on Hofstede's 95-point system. But, again we found that a certain leveling between the cultures has occurred.

The ICT use from U.S. interviewees—highly masculine on Hofstede's dimension—and Norwegian interviewees—strongly feminine—looks very much alike. We find that in addition to their masculine characteristics such as assertiveness and workaholic tendencies, the U.S. also exhibits many feminine traits such as using ICTs to slow down the work pace of their lives. Norwegians, meanwhile, are talking about being competitive and carrying cellphones for work purposes all the time—very masculine traits. But Americans also talk about maintaining relationships with kids, family and friends—more feminine traits. Two themes are predominant in our MAS findings: a growing emphasis in Norway on using ICTs competitively and in the U.S. on using them for play and social support. Each of the two cultures has moved closer toward the style of the other, and thus their differences have been leveled.

Our findings in the IDV and MAS dimension not only counter Hofstede's findings, but they suggest that ICTs blur the concept of individualism vs. collectivism and masculinity vs. femininity. While Hofstede uses oppositional terms in both of these dimensions, our claim is that ICTs have the potential to enable and enhance both ends of the scale. For example, ICTs enable users to take advantage of the larger community of expertise, through Newsgroups, when trying to solve a problem. The Newsgroup, as an ICT, then serves to enhance the individual in achieving work tasks and goal. Similarly, ICTs are powerful for both work and play, therefore capable of blurring the boundaries between feminine and masculine behavior. Due to the ubiquitous and

pervasive nature of modern ICTs, they are problematic for Hofstede's methodology. We interpret this by explaining that the posited variation might be leveled through the reflexive relationship between culture and ICT. The findings for both these dimensions clearly illustrate a lessening of the extremes, resulting in a change for both cultures. We now turn to plausible explanations for the leveling that has occurred between the United States and Norway, as displayed through ICT use.

We rely on descriptive data and knowledge of various theoretical perspectives to propose several plausible explanations. In the process, we will combine and extend two different theoretical perspectives that might be a foundation for explanation. For the leveling effect, we propose four explanations for it. First, the leveling of national culture differences could simply be a function of the subculture we chose for this study – advanced ICT users. Perhaps those experienced with technology use it in similar ways, so the culture change we find is unique to this subculture. Support for this theory exists in our data, since one Norwegian interviewee claimed, “I have more in common with other advanced users than I do with inexperienced users in my own country.” But even Hofstede's original work was situated inside a multi-national technology organization, IBM, and it is likely that those individuals were higher-end users of technology than the general population.

A second possible explanation and contributing factor is that leveling occurs through indirect and external events. For example, external events affect ICT use, and these new technology appropriations are indicators of a culture change. Our data categories of 9/11 (referring to the Sept. 11th, 2001 terrorist bombing of the U.S. World Trade Center) and the Dot.Com Crash (referring to the economic changes resulting from the U.S. stock-market crash of 2001) suggest that as a result of these losses, U.S. interviewees began to use technologies in more feminine ways. But while these events could have triggered a hard shift toward femininity, we also see evidence of slight shifts toward femininity in the first part of the U.S. data that was collected prior to these events. Norway has also had some triggering events that might account for leveling. It can be argued that the policy decision made by the Norwegian government to fund the country's ICT expansion increased ICT use and created a more masculine focus on the importance of competitiveness. Furthermore, during the last 15 years Norway has undergone massive privatization of government services as well as deregulation of industries such as telecommunication. To stay competitive and operate efficiently, all sectors have had to implement ICTs, and this no doubt created a more competitive, aggressive attitude, hence a more masculine focus. We found a number of Norwegian interviewee comments that made this connection to masculinity.

Third, Orlikowski (2000) explains that much research confuses two different aspects of technology. The first consideration is that technology is an artifact, complete with the material properties embedded in its design. This includes things as basic as the ability to send a message from inside a program, a feature that was designed into email software. Flanagin, Farinola, and Metzger's (2000) view of the technical code of the Internet informs this artifactual nature of ICTs, while Orlikowski's technologies in practice informs the emergent use. Flanagin et al. apply Feenberg's (1999) concept of the technical code—“the cultural assumptions literally designed into the technology itself” (Feenberg, p. 87)—of ICTs. Technical artifacts, such as computers, the Internet, or computer software, have a technical code inscribed that causes users to act in a certain way (Akrish, 1992; Feenberg, 1999; Flanagin et al., 2000). For the Internet and World Wide Web, these authors argue that values, choices, and assumptions by the designers have literally been built into them. The technical code perspective is compelling when considering the way many of our interviewees talked about their use of Web applications such as search engines and Newsgroups. Both of these applications “force” the participants to behave in certain ways because of inherent design features, or technical codes, in the product. A predominant feature of

such applications is that they presuppose the use of English as the working language, and allow for people to participate incognito. Another example from our dataset deals with the use of Microsoft (MS) products. The ease of transferring information from MS Internet Explorer to MS PowerPoint and MS Word was mentioned by participant in both countries. Because of this ease, and high diffusion of Microsoft products in both countries, it not surprising that people will use them in similar ways. Flanagin et al. argues, by examining demographic data, design features, existing policy, and usage patterns, that it is clear that the Internet reflects values and norms such as freedom of speech, inclusiveness, open access and sharing of information, decentralized control and free market economics (Flanagin et al., 2000). The convergence literature (see Stohl, 2001 for a review) argues that there are “a set of imperatives embedded in the global economy that results in a similar organizational structuring across nations.” (Stohl, p. 325). This literature presupposes that specific features of the global environment, such as well diffused ICTs, determine organizational form and concomitant communication practices. Given these characteristics, it is not surprising that the Internet was created and is shaped predominantly by countries who value democracy and free speech such as the United States and the Scandinavia countries. Flanagin et al. conclude that, “the technical code of the Internet and other ICTs openly reveals its predominately American influence” (2000, p. 421). However, had Norway simply adopted a more masculine style, then we could argue that the artifactual nature of ICTs can change national culture characteristics. However, this is not the case since the U.S. has also become more feminine.

Orlikowski’s (2000) second consideration deals with differences in how individuals actually use the technology over time. While Flanagin et al. (2000) acknowledge that usage of the Internet can provide insight into its technical code, Orlikowski’s technologies in practice view argues for an ever-changing technology perspective. She shows how the same ICT can be used in completely different ways by three separate subcultures inside one organization. Based on Orlikowski, we can conclude that just because the Internet was developed in the U.S., it does not mean that other cultures will use it the same way. For this reason, “A practice lens more easily accommodates people’s situated use of dynamic technologies because it makes no assumptions about the stability, predictability, or relative completeness of the technologies” (Orlikowski, 2000, p. 407).

Even though we acknowledge and see evidence in the data of how national culture might affect ICT use, and conversely, how ICTs affect national culture, we argue that the relationship between culture and ICTs is reflexive. In other words, the findings demonstrate that there is no dominant force – such as ICT impacting culture, and not the other way around. As Slack and Wise (2002) observe: “The relationship between technology and culture is contingent, not determined... [N]either we nor ICTs are slave to the other.” The relationship between culture and ICTs is considered “reflexive” since they are mutually causal and will change over time. According to Silverstone and Haddon (1996), the relationship is “doubly articulated” in that the social—that ICTs, their hardware and their software, are the focus of meaning construction at the same time as they enable it. Yet a complex substructure is intertwined within these ICTs and with what, when and how they enable us to communicate. The ICTs and communicative actions have become inseparable (Silverstone & Haddon, 1996). Finally, we cannot take for granted that the arguments offered above explain entirely the leveling of cultural differences that has occurred between Norway and the U.S. since Hofstede’s study in 1980. We speculate that way the changes have occurred in each country is different (i.e. 9/11 in the U.S. and national IT reforms in Norway).

Future Directions & Limitations

While Hofstede called his dimensions characteristics of an entire national culture, by using only top executives within IBM – a multinational organization – we view our findings as more localized. It’s important to remember that this was a workplace study of 72 individuals who are

all advanced ICT users, so they were a specialized subset of their organization and the general population of their country

This paper makes a theoretical contribution to existing work by illustrating how culture can be included as an important theoretical construct in research on ICT use in organizations. Furthermore, the practical implications of this study will hopefully benefit organizations which are, or are contemplating, bringing their business into the global arena. Although the findings can not be generalized outside the U.S. and Norway, the implications of the study will hopefully create a critical awareness of the relationship between culture and ICTs applicable outside these two countries.

Future studies may test our findings. A multi-national study of advanced users might shed light on the characteristics of this subculture. It is important for these studies to focus on a micro approach, such as comparing a limited number of ICTs, in addition to a macro approach, such as this study. It would be particularly valuable to understand if organizations operating across cultures might use different ICTs yet use them in similar ways or to accomplish desirable objectives. Both theoretical and practical value can be surfaced if the leveling concept is further developed. It is also likely that an ICT like the Internet does not behave the same as a cellphone or a pager. Future studies might see if different ICTs (email vs. cellphone) contribute to the various Hofstede dimensions in different ways. The vast body of literature on group decision support systems might be an ideal place to examine these differences. Furthermore, researchers have argued about if ICTs either have embedded technical artifacts (Feenberg, 1999), or if those features designed into the technology are changed by interaction with users (Orlikowski, 2000). If Hofstede's framework were applied to this body of knowledge, additional insight would certainly result.

Also, studies of notable triggering events can be undertaken to evaluate their impact—either direct or indirect—on ICT use and potentially national culture. This study was not consciously designed to collect data before and after September 11th, 2001; however given that this tragic event transpired in the middle of our data collection, we found some differences. Researchers can use our study as an impetus to explore serendipitous research timeframes. In addition, studies can be consciously designed to examine external triggering events. Perhaps major organizational changes can provide insight into this issue. Several existing theories such as diffusion of innovation (Rogers, 1983) and punctuated equilibrium (e.g. Tushman & Romanelli, 1985) might be a useful theoretical explanation for how use changes over time.

This study has combined social-psychological dispositions (Hofstede's cultural categories) with reports of individuals' use of technology (including how they use the computer, phone, and face-to-face communication) to show that culture—“how things are done here”—depends on individual skills, the presence of technology, and historical memory. Furthermore, it is important for managers and scholars to develop a culturally-based understanding of technology use in organizations and nations, as ICTs will continue to play a critical role in organizations across the globe. As individuals make sense of ICTs they will continue constructing, using, and modifying such technologies. As scholars, our task is to study usage patterns, adoption rates, effects, and impacts of new and existing ICT within and across national borders. It is through our theoretical contributions that we develop sustainable explanations for behavior.

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