Uncertainty avoidance, IT perceptions, use and adoption: Distributed teams in two cultures

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ABSTRACT

Variations in cross-country adoption of Information Technology (IT) are not only due to economic but also cultural factors. The adoption of new technologies involves risk and uncertainty. Cultures with high levels of Uncertainty Avoidance (UA) feel threatened by the unknown and tend to conform to existing norms and procedures. Consequently, they tend to exhibit lower rates of IT adoption. This study explores the relationship between the Uncertainty Avoidance dimension in Hofstede's framework and the perceptions of distributed groups toward group technology in two countries with significant differences in the level of UA. According to the results of the study, there are significant statistical differences in groups' perceptions toward IT. Cultural differences do impact perceptions and attitudes toward IT and, ultimately, the adoption and use of IT.

Keywords: IT perceptions, IT adoption, cultural differences, uncertainty avoidance

INTRODUCTION

Perceptions of and meanings attributed to IT usually differ among cultures. These perceptual differences, along with economic factors, impact adoption decisions (Erumban & de Jong, 2006). In fact, the extant literature in IT adoption cautions against the unquestionable adoption, dissemination and application of management practices and IT (Purohit & Simmers, 2006) and considers cultural differences among those factors shaping the reason behind the adoption of IT (Leung et al, 2005; Martinsons & Davidson, 2003). Technologies are said to be culture-bound (Goulet, 1977), and their effects culture-determined (Fukuyama, 1995).

A number of studies in cross-cultural issues related to IT has provided evidence to support the claim that cultural factors moderate the adoption of IT (e.g., Erumban & de Jong, 2006; Huang et al, 2003; Karahanna, Evaristo & Srite, 2002; Meyers & Tan, 2002). Cultural differences have been found to impact both the perceived usefulness and the perceived ease of use of IT (Parboteeah et al, 2005), which, in turn, moderate intention and, ultimately, the adoption of IT (Taylor & Todd, 1995; Davis, 1989).

Differences in the level of Uncertainty Avoidance determine the rate and pace of innovation (Singh, 2006; McCoy, 2002; Shane, 1995). UA has been found to have a negative relationship with the adoption of IT (Erumban & de Jong, 2006). IT adoption is greater in highly individualistic, low power-distance societies (Bagchi et al, 2004). Power distance has an effect on the acceptance of email by users in different cultures (Huang et al, 2003).

Cultural differences (i) have a dominant role in determining the perceptions, beliefs, and behaviors of people from different cultures (Leung et al, 2005; Sivakumar & Nakata, 2003) and, ultimately, their behavior (Hofstede, 2007; Steenkamt, 2001); (ii) influences group processes and outcomes (Sivakumar & Nakata, 2003), and performance (Sivakumar & Nakata, 2003); (iii) impact their intention to adopt IT (Huang, Lu & Wong, 2003); (iv) influences the adoption and use of IT (Erumban & de Jong, 2006; Straub & Keil, 1997); and (v) moderates the effectiveness of IT adoption (Bagchi, Hart & Peterson, 2004).

This study explores group perceptions of IT in two distinct cultures. Specifically, it focuses on studying the relationship between the Uncertainty Avoidance dimension in Hofstede's framework and a group's perceptions of the technology. Unlike Bagchi et al's (2004), and Erumban & de Jong's (2006) studies, which used secondary data, this study relies on working groups and their perceptions, attitudes and behaviors with the technology and, ultimately, with the intention to adopt it. The findings of their studies indicated that IT adoption was greater in: (i) individualistic societies; (ii) societies with low power-distance scores; (iii) culturally-feminine societies. Although Bagchi el al's hypothesis stating that IT adoption is lesser in nations with high uncertainty avoidance indexes was not supported, Erunmban & de Jong found this to be statistically significant. This study contends that differences in the level of Uncertainty Avoidance determine how the group perceives and uses IT and, ultimately, adopts it.

CULTURAL DIFFERENCES, PERCEPTIONS AND USE OF IT

In this study, cultural differences are asserted to impact the way in which groups perceive and use IT and, eventually, adopt it. The Adaptive Structuration Theory (AST) criticizes the techno centric view of IT (i.e., IT is beneficial by its own nature) and emphasizes the social aspects that moderate its use and adoption (DeSanctis & Poole, 1994; Salisbury & Stollak, 1999). AST asserts that group technologies are not objects that are necessarily adopted in similar

ways by all groups, but are appropriated by each group uniquely (Wagner et al, 1993). It also asserts that group outcomes are determined by a rather complex and continuous process, in which technology elements are appropriated by the users of the technology, in ways that produce and reproduce the structure of their social environment.

AST emphasizes the importance of attitudes toward IT as determinants of group performance. Cultural differences play a dominant role in determining the attitudes and behaviors of people from different cultures (Hofstede, 2007; Steenkamt, 2001; Clark, 1990). Culture influences actual behavior through its influence on attitudes, and norms and, ultimately, impact the adoption and use of IT (Erumban & de Jong, 2006).

Culture has been defined as a set of values and beliefs common to members of a group, which differentiates this from other groups (Hofstede, 1980). According to Hofstede (1980), culture is "a collective phenomenon, because it is at least partly shared with people who live or lived within the same social environment where it was learned." (1980). Hofstede also defines culture as a function of five dimensions or dichotomies: Power distance, uncertainty avoidance, individualism-collectivism, masculinity-femininity, and time horizon. In spite of several challenges to Hofstede's operationalization of culture, and therefore his results (e.g., Venaik & Brewer, 2010; Erez & Earley, 1993), the use of the framework has been pervasive (Davis et al., 2012; Litvin et al., 2004). Hofstede's definition of these cultural dimensions has been considered appropriate for the purposes of this study.

Hofstede's value-based model predicts individual and group perceptions, attitudes and behaviors based on national culture (Pauleen, 2003). Cultural differences are said to affect perceptions, beliefs and behaviors (Harrison & Huntington, 2000), team interaction (Chidambaram & Kaut, 1993), and group adoption and use of IT (Erumban & de Jong, 2006; Straub & Keil, 1997).

UNCERTAINTY AVOIDANCE AND IT PERCEPTIONS IN DISTRIBUTED GROUPS

The level of Uncertainty Avoidance (UA) is a function of the degree to which a social group feels threatened by ambiguous, uncertain, unknown situations (De Mooij & Hofstede, 2010; Ford et al, 2003). UA reflects the extent to which a society attempts to control the uncontrollable (Hofstede, 2001). The higher the level of UA, the more social groups prize structure and avoid taking risks (Hofstede, 1980). UA helps in explaining why societies adopt both strict codes of behavior and formal rules. (Tipurik et al, 2007). People in high UA societies rely on written rules and prefer stability (Parboteeah et al, 2005), exhibit low interpersonal trust, take known risks and resist change and innovation (Di Rienzo et al., 2007; Singh, 2006; Shane, 1995). On the other hand, when the level of UA is low, trust is widespread, people both rely on fewer written rules and welcome change and innovation (Bagchi et al, 2004). Individuals with high levels of UA are concerned with security in life and exhibit a need for consensus (Tipurik et al, 2007).

IT inherently involves change and uncertainty (Erumban & de Jong; 2006; Parboteeah et al, 2005). Societies with high scores on UA perceive change negatively, are not early adopters, and will unlikely perceive IT as useful to their work (Tipurik, 2007; Ford et al, 2003; McCoy, 2002).

Unlike co-located teams, distributed groups communicate and complete their tasks by relying solely on IT. IT geared to support teamwork levels the play field for all group members, reduces communication barriers and eliminates some of the social cues that may hinder equality

of participation. It ultimately facilitates a more egalitarian distribution of participation and influence (Fjermestad & Hiltz, 1999; Mejias et al, 1997). Moreover, these technologies are said to focus groups' efforts on the task at hand (McGrath, 1984), and bring process gains. When distribution of participation is more egalitarian, and groups perceive the technology facilitates their task-solving; they analyze more ideas, in more depth which, in turn, leads to decisions of better quality. Positive perceptions about the ability of the technology to facilitate problem solving ensure that groups perceive the media is more effective (Fjermestad & Hiltz, 1999). Ultimately, groups manage conflict more effectively, and are more satisfied with the process and its outcomes.

Groups in high UA societies perceive IT as a source of uncertainty and, consequently, change. They seek to add structure to their environment (Chui et al, 2002) and prefer greater standardization (Newburry & Yakova, 2006). IT focuses their efforts on their tasks and improves the quality of the group process. Although they tend to be unwilling to challenge authority and rules (Rapp et al., 2011), groups may change their attitudes as they perceive IT both facilitates a more egalitarian participation and brings process gains.

Although the extant literature says groups with high UA are more risk-averse, do not like making changes, and have a lower rate of IT adoption (Erumban & de Jong, 2006), this study claims that positive perceptions toward the technology make them more prone to adopt and use IT.

Hypothesis 1: Distributed Groups in societies with high UA will perceive more process gains than their counterparts in low UA societies.

Hypothesis 2: Distributed Groups in societies with high UA will be more satisfied with their processes than their counterparts in low UA societies.

Hypothesis 3: Distributed Groups in societies with high UA will perceive the quality of their decisions is higher than that of their counterparts in low UA societies

Hypothesis 4: Distributed Groups in societies with high UA will be more satisfied with their decisions than their counterparts in low UA societies

RESEARCH METHODS

The study used a set of three questionnaires to collect perceptual data from distributed groups solving a marketing case. A total of 176 subjects in 44 groups participated in the project. Group members were MBA students and, according to the data collected all had experience in both business and working in groups. They received extra credit for their participation in the study. The sample comprised 19 groups from a Colombian university, and 25 from two American 4-year colleges.

While Colombia is defined as a country with high levels of UA (UA Index = 80). the U.S.A. is considered to be a low-UA society (UA Index = 46).

Groups were asked to solve the case following a structured, timed agenda that was based on Simon's rational model of decision-making. All the interactions and discussions were IT supported.

Both the case and the instruments were translated forward and back from English into Spanish, and checked by two professional interpreters to insure complete equivalence. UA Index was the independent variable. The dependent variables were perceptual measures of Process Gains/Losses, Satisfaction with Process, Quality of Decision and Satisfaction with Decision, collected in the post-study survey, using Likert-type scales. Higher values were associated with more positive perceptions. The hypotheses were tested using single-factor ANOVA.

UA AND IT PERCEPTIONS: RESULTS

As indicated in Table 1 (Appendix), there is statistical support for hypotheses 1, 3 and 4 at the 0.01 level and for hypothesis 2 at the 0.05 level. Colombian groups reported a higher level of satisfaction with both the process and the solution, and perceived the process brought more gains and the decisions were of higher quality than their counterparts in the U.S.A.

A possible explanation for the level of significance of the results associated with hypothesis 2 could be found in one of Hofstede's cultural factors, namely Power Distance. Cultures with a large Power Distance (e.g., Colombia) emphasize autocratic rather than participative management practices (Mejias et al, 1997). Albeit IT for groups propitiates a more egalitarian distribution of participation, it could be that individuals still accept the inequality of power that prevails (Tipurik et al, 2007), and the existence of coercive power. As a consequence, their participation patterns may show an imbalance in the contributions made by the members of the group, and, ultimately affect their perceptions about the process.

Although high UA groups may see IT as uncertain and risky, their perceptions of usefulness and performance-enhancing features make them more willing to use it. In fact, groups tend to consider the electronic environment propitiates a more effective handling of the group tasks and, consequently, express higher levels of satisfaction with both the process and the outcome and are, ultimately, more prone to adopt the technology (Perez-Alvarez, 2008). Although they may resist change, groups could consider that the risks are offset by the improvements the technology brings to both the process and the outcomes.

Group technology focuses groups' efforts on the task-dimension and promotes a more egalitarian distribution of participation, which in turn makes groups become more cohesive (Dailey, 1980). Although Colombian groups might exhibit some disposition to resist change, they could be more willing to adopt IT as they perceive technology helps them perform more effectively. Groups in Colombia reported higher levels of satisfaction with both the process and the outcome, and more positive perceptions of both process gains and decision quality. Positive perceptions about the ability of the technology to support goal attainment, as well as higher levels of satisfaction with the technology, are associated with willingness to use the technology (Perez-Alvarez, 2008).

CONCLUSIONS

National culture has an impact on perceptions, beliefs, behaviors (Leung et al, 2005; Sivakumar & Nakata, 2003) and IT adoption intention (Huang, Lu & Wong, 2003). In fact, as groups from culturally distinct societies use IT, their perceptions and level of satisfaction differ. Such differences are a function of the differential found in some cultural dimensions such as Uncertainty Avoidance. Although UA Avoidance also affects perceptions and adoption of IT, its impact is moderated by other cultural dimensions. Such differences also influence how IT is

adopted and used (Straub & Keil, 1997), moderate the effectiveness of IT adoption (Bagchi, Hart & Peterson, 2004). Furthermore, they also affect group processes and outcomes (Sivakumar & Nakata, 2003) and, ultimately, performance (Sivakumar & Nakata, 2003).

In conclusion, the effective adoption of group technologies requires a fit between the features of the technology and the cultural aspects of the environment in which they will be used. One could ask whether the impact of cultural differences on IT adoption varies by type of IT or by the experience groups have with IT. If it does, the question would specifically ask for the type of fit needed for each type of technology.

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APPENDIX

Table 1 - Perceptual Measures Mean Scores

Variable / Country	Colombia	U.S.A.	p
Uncertainty Avoidance Index	80	46	
H1: Perceived Process Gains	4.00	3.25	<0.0001
H2: Satisfaction with Process	3.43	3.09	0.0437
H3: Decision Quality	4.15	3.40	<0.0001
H4: Satisfaction with Decision	3.87	3.49	<0.0001