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Delivering the Cross-cultural Virtual Teamwork Experience: An Example with Mexican and American MBA Team Members

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Abstract

A modern geographically dispersed workforce often takes the form of virtual teams, where competent individuals located anywhere in a transnational firm represent organizational knowledge assets that need to interact to accomplish organizational tasks. This new organization form is likely to be most fruitful when virtual team members have skills with the supporting technologies, an aptitude for asynchronous, distributed teamwork, and often, some sensitivity to cultural issues that may arise when working with a colleague from another culture. We argue that this work form is becoming increasingly common, and that exposure to it is beneficial to undergraduate and graduate students who are likely to work in this fashion at some point in their careers. We offer a model for the study of virtual teamwork and brief reviews of relevant literatures on virtual team support technologies and cross-cultural management issues pertaining to technology use. We present here an exercise that involved U.S. and Mexican MBA students in a cross-cultural virtual teamwork experience, offer some suggestions for using this type of exercise in an undergraduate or graduate MIS or MBA course, and some of observations gathered along the way.

Keywords: Virtual Teamwork, Cross Cultural, MBA Education

1. INTRODUCTION

Entering the new millenium, globalization of business enterprises is a fact of life. Whether it is access to foreign markets, offshore manufacturing, strategic alliances, or other rationale, as firms transcend national borders, they inevitably must transcend cultural borders as well. The key to managing any geographically dispersed workforce is communication. A modern geographically dispersed workforce often takes the form of virtual teams, where competent individuals located anywhere in a transnational firm represent organizational knowledge assets that need to interact to accomplish organizational tasks. This new organization form is likely to be most fruitful when virtual team members have skills with the supporting technologies, an aptitude for asynchronous, distributed teamwork, and often, some sensitivity to cultural issues that may arise when working with a colleague from another culture. We argue that this work form is becoming increasingly common, and that exposure to it is beneficial to undergraduate and graduate students who are likely to work in this fashion at some point in their careers. We present here an exercise that involved U.S. and Mexican MBA students in a cross-cultural virtual teamwork experience, offer some suggestions for using this type of exercise in an undergraduate or graduate MIS or MBA course, and some of observations gathered along the way. Rather than using larger groups and many different cultures employed in similar studies (e.g.,

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Knoll & Jarvenpaa, 1995), we limited the present example to intercultural dyads made up of one member from the United States and one from Mexico. Given the tremendous amount of business and social exchange between these two cultures and the fact that much collaborative work is dyadic, we believe that this specific and parsimonious focus is exceptionally valuable. However, readers can easily duplicate this type of exercise using groups of varying sizes from whatever cultures are desire. We begin with some theoretical as well as some applied perspectives on this type of work. Then we present our study, and conclude with our various insights and suggestions.

2. BACKGROUND

The Virtual Team: An Emerging Organizational Form

The growing popularity of the team work unit, advances in telecommunications networks and software to support distributed group work (groupware), and a hypercompetitive business environment have been the catalysts for new organizational forms, the virtual organization, and its smaller version, the virtual team (Jarvenpaa and Ives, 1994). Virtual team members are geographically and often temporally distributed, possibly anywhere within (and beyond) their parent organization and represent organizational knowledge assets that need to collaborate to accomplish tasks. Typically, the members have different areas of expertise and knowledge, and often work in different functional areas (Lipnack and Stamps, 1997; Townsend et al., 1998; Duarte and Snyder, 1999). The virtual team, via groupware, can interact and collaborate though separated by distance and time. This ability gives organizations increased flexibility and responsiveness, permitting them to rapidly form relevant distributed knowledge assets into a virtual team that can work on any urgent project. When finished, the team can be disbanded and members redeployed to other projects; members may also serve on multiple virtual teams simultaneously.

The virtual team is an emerging and relatively unstudied organizational form. Enabled by emerging technologies, new organizational forms can present a myriad of managerial challenges, with ambiguous roles for its members, potentially high coordination costs, worker reassignment, undetermined performance standards and metrics, and accountability issues (DeSanctis and Poole, 1994). Piccoli (1999) categorizes virtual team management issues as internal (e.g., identification of processes and characteristics of effective virtual teams), external (e.g., team boundaries, gatekeeping, external communication), technological (support systems), and societal (implications for individuals and society). The present paper offers an exercise to primarily explore some of the internal and technological issues of virtual team participation and management.

Technological Support of Virtual Teams

The virtual team is enabled by emerging computing and telecommunications technologies that support and coordinate communication and workflow between inter- and intraorganizational actors on an "anywhere" and increasingly "anytime" basis (Nunamaker, Vogel, and Potter, 1997). Beginning as telegraphy and telephony and now manifested as wide area networks such as the Internet and its World-Wide Web (WWW), global telecommunications backbones support a growing number of specialized software tools known as groupware that can manage work processes such as document management, workflow, group decision making, planning, and a number of other common group tasks as well as the intragroup communication (Dennis, Pootheri, and Natarajan, 1998; Nunamaker, et al.,1997). The breadth, type, and sophistication of support ranges from comprehensive systems such as Lotus Notes/Domino to task-specific classes of systems such as electronic meeting systems (EMS) to simple electronic mail, but a common denominator is their ability to support textual communication (Coleman, 1997). Such communication is known as computer-mediated communication (CMC).

The term for the electronic working environment of computer-supported work groups (i.e., virtual teams[1]) is a collaboratory. Collaboratories are environments that fuse computer and electronic communication technolgy into support infrastructures that improve the pace and quality of discourse among persons collectively engaged in a project of undertaking (Rosenberg, 1991; Hamlainen, Hashim, Holsapple, Suh, and Whinston, 1992; Barua, Chellappa, and Whinston, 1995). With open architecture Internet platforms such as the WWW and the proliferation of inexpensive communication software such as browsers, and the development of the web-based groupware mentioned above, collaboratories are no longer the exclusive domain of the research community, but are becoming commonplace in any organization that requires them. Although human communication behavior via basic CMCs such as Email has been extensively studied (Keisler and Sproul, 1992; Hiltz and Turoff (1993), communication is just one of several distributed group work behaviors. As there is a greater array of virtual team behaviors that can occur in collaboratories and many of them have not received study in this unique environment, we present below a framework for this research.

3. A FRAMEWORK FOR THE STUDY OF VIRTUAL TEAMWORK

The Virtual Teamwork Framework (see Figure 1) integrates various elements of previous research on group processes and group decision-making (e.g., March and Simon, 1958; McGrath, 1984; Nutt, 1984). The model encompasses contextual factors such as organizational pressures and constraints; individual and group characteristics of team members; and the nature of

the problem or task. The task completion section contains two tyes of elements--the collaboration stages, and the socio-cognitive process dynamics that capture the group dynamics and information processing factors believed to have an impact on task outcomes. The model proposes that socio-cognitive process dynamics have a direct or moderating effect on how the task is carried out, and hence, play a significant role in the eventual outcomes. Finally, relevant task and process-related outcomes of the process are identified. Following is a brief description of each of these aspects of the model.

The teamwork context

The model specifies three types of factors as relevant and important elements of the context of teamwork. Organizational factors such as the nature of the business strategy, organizational goals and priorities, culture, roles, relationships and assigned accountability shape the broad context in which projects proceed. International virtual teamwork is also likely to belimited by resource and situation constraints, and interdependencies which exist between the problem or task and other activities or goals of the organization. Team variables include the heterogeneity and diversity of team member backgrounds, languages, opinions, values, expectations, styles and interests as well as individual cognitive abilities and characteristics such as cognitive complexity, intellectual flexibility, creativity, motivation, and task-relevant knowledge. Personality characteristics such as dominance, introversion/extroversion, persistence, flexibility, needs for power, affiliation, and achievement, and commitment. Team context variables also include the team members' assessment of each other's skills and capabilities, and the history and quality of working relationships that might exist among team members. Task variables include the complexity of the task, the degree of ambiguity and uncertainty associated with the analysis and/or solutions; the urgency with which the task must be completed; the importance and likely impact of the work; the nature of the resources available; and the nature and form of the information available for analysis.

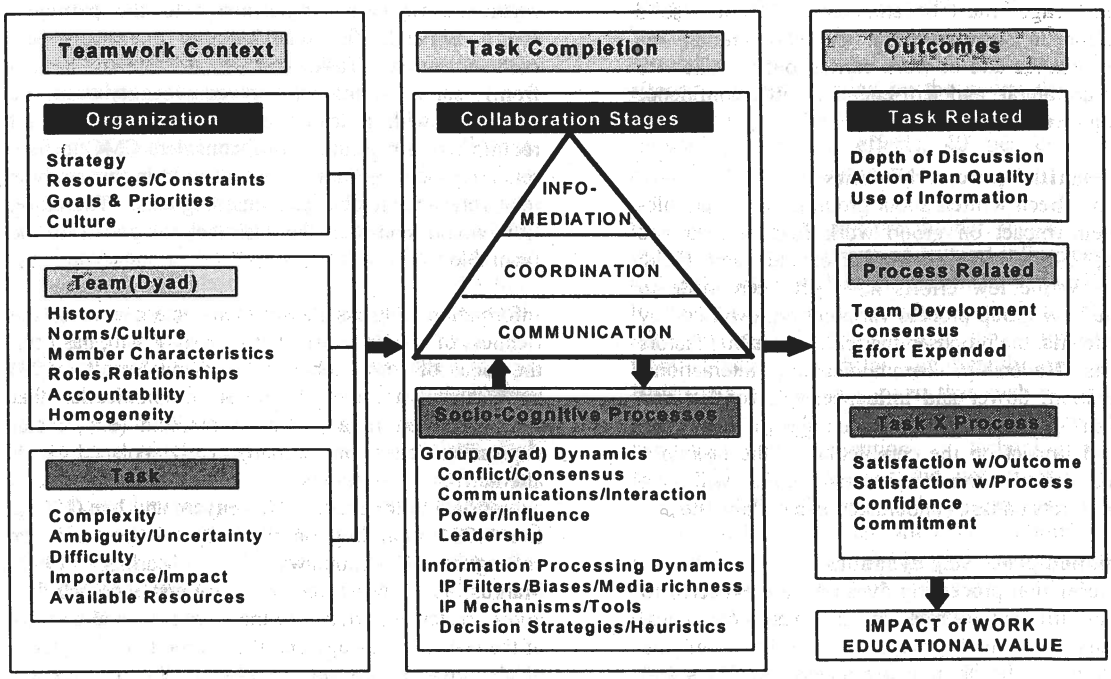

Figure 1. *The International Virtual Teamwork Framework for Analysis*

Task completion factors

The analysis of task completion is comprised of two elements: the collaborative stages and the social and cognitive process dynamics that influence how the task is carried out within these stages. The stages of collaboration are ar the heart of the framework. A first level for collaboration requires the infrastructure and the "will" to communicate. In practical terms, this means the availability of communication channels like those made available by phone lines, Email, and the

Internet. It also means that, for communication to take place even at the most elemental level, there has to be intention (i.e.,"will") and effort expended by the communicating parties.

It is only after the channels of communication are well-tested and the communicating partners are comfortable with the communication will there be any attempt at coordinating activities through the media. Groupware, as discussed previously, are technologies that support coordination of communication and work processes. In this model, we define the coordination level as the level where the team members use bandwidth in a more intelligent and efficient manner. At that level, the content of the interaction should reveal purpose and goal orientation, coordinating activities, and serious attempts at evaluating the strengths and weaknesses of the various processes underway.

Info-mediation is the stage when communication is assumed and coordinating activities commonplace, and participants implement formal decision strategies and other problem-solving/task completion methodologies. For successful info-mediation, the previous stages must be attained. Without a solid foundation in communication and coordination, the decisions made and or work carried out are likely to appear unilateral, and will engender little confidence or commitment.

Socio-cognitive process dynamics

Much has been written about group process variables and their impact on group work (e.g., Guzzo and Waters, 1982; Miner, 1984; Tjosvoldt and Field, 1983). While few efforts have yet been made to validate how group process variables are exhibited by virtual teams, the proposed model assumes that factors such as leadership, communication, interactions, participation, power and influence, and conflict and consensus-building that have been shown to have a profound impact on the completion of the task in a conventional environment (Alderson, 1993) will have similar effects on tasks undertaken in a collaboratory.

Information processing dynamics

The information processing dynamics are expected to play an influential role in the task outcomes, especially in virtual groups. Availability of the technology, its limits, media richness, its filters and mechanisms are all variables to be examined for the impact on task completion and decision making (DeSanctis and Poole, 1994; Daft and Lengel, 1986; McGrath and Hollingshead, 1994).

Decision/task outcomes

The model identifies several important decision and task outcomes relevant to virtual groups. These include task related outcomes such as use of available and pertinent information, and the depth of the discussion(s), and the quality of the action plan(s) and /or decisions generated; process related outcomes such as level of cognitive time and effort expended, level of consensus, and impact of the process on relationships among team members; and task x process outcomes such as satisfaction with the task outcomes and processes, and confidence and commitment related to the outcome produced. We now turn to a discussion of cultural aspects of collaborative technology use.

Other Theoretical Considerations: I Task-technology fit

Information richness theory (IRT) (Daft & Lengel, 1986) is concerned with characterization of different communication media and their relative suitability for different types of organizational communication. "Richness" is a quality that comes from a medium's capacity to support immediate feedback, alternative communication channels such as facial expressions, body language, and tone of voice, and variation in use of language. Face-to-face communication is considered the richest medium, followed by telephone, personal documents, impersonal written documents, and numeric documents. IRT holds that people select a medium for communication by matching the medium's richness (or leanness) to the particular task's demands for unambiguous or unequivocal communication. Tasks that can tolerate (or benefit from) some ambiguity or equivocality can be supported with a lean medium; those that cannot require a rich medium. IRT considers CMC to be a relatively rich medium. The task used in this study is relatively unequivocal and unambiguous. Therefore, IRT would consider the task-technology fit to be favorable.

Information richness theory's characterization of the richness of certain media, particularly Email, has been the focus of some debate. Hiltz and Turoff (1993) have shown that some forms of communication that are suppressed in a particular medium (e.g., facial expression cues in e-mail) can replaced with alternative expressions of the same message appropriate to the media. Ngwenyam and Lee (1997), Lee (1994), building on work by Markus and her colleagues (El-Shinnawy and Markus, 1992; Markus,1994) argue that an interpretist approach that gives greater importance to the environmental context of the (e-mail) message and the actors involved yields much greater insight and richness in textual communication compared to what would be found using the positivist approach implicit in information richness theory. Finally, in a recent study using CMC, Dennis and Kinney (1998) did not find support for IRT's central premise that matching media richness to task equivocality improves task performance. Although these findings raise serious questions about IRT, particularly with regard to Email, they generally imply that Email is more and not less suitable for the present task than the theory prescribes.

Other Theoretical Considerations: II Cultural aspects of collaborative technology use

Whether management practices or technologies developed in one culture are desirable or effective in different cultures has been a subject of research for some time (Hofstede, 1980a, 1980b,1993). These questions have more recently been taken up by information systems researchers (Straub, 1994; Balthazard and Potter, 1996; McLeod, Kim, Saunders, Jones, Scheel, and Estrada, 1997; Mejias, Shepard, Vogel, and Lazaneo, 1997). Researchers have shown that cultural background shapes values, and values in turn shape behaviors in a number of tasks (negotiation, for example, Bond & Smith, 1996). Research is now beginning to indicate that culture also shapes attitudes that impact on how technology is used. When considering the use of modern technologies to support collaborative work by users of different cultural backgrounds, understanding culture's effects is doubly important. Such an understanding is not easily gained, however, even when limited to well-understood tasks and technologies. There are many, many different national cultures, cross-cultural theories that frequently require creative interpretation to be applicable to common organizational tasks and circumstances, and numerous ethnographic and anecdotal characterizations of culture that may or may not generalize to the situation under study.

Findings of studies aimed at determining the influence of culture on management in general and information system use have been mixed (McLeod et al., 1997). Probably the most popular characterizations of culture and dimensions along which cultural differences can be measured come from Hofstede (1980a). His four most commonly used dimensions are power distance, uncertainty avoidance, masculinity/femininity, and individualism/collectivism. Power distance refers to the extent that a boss and a subordinate can determine each other's behavior. Uncertainty avoidance is the degree to which members of a society feel uncomfortable with uncertainty and ambiguity. Masculinity/femininity refers to preponderance of masculine or feminine goals endorsed by members of a particular culture. Individualism describes the relationship between the individual and the collectivity that prevails in a given society.

Unfortunately, the linkage between characterizations of external (i.e., nonorganizational) cultures and organizational behaviors is often tenuous and inconsistent across organizations, even those embedded in the same culture. Hofstede's measures by themselves often cannot reliably account for differences (or lack of differences) in organizational behaviors across cultures. This does not mean that they are flawed, but rather that they are abstract and often require some careful interpretation to tie them to the dependent variable under consideration; even then, researcher have little a priori insight to the strength of effect that these manifestations of culture will have on their dependent variables. Hofstede's uncertainty avoidance measure had mixed explanatory power in Straub's (1994) study of Email and FAX use among Japanese and American knowledge workers. Straub theorized that increased desire of the Japanese for uncertainty avoidance relative to Americans should lead to a preference for rich communication media. The hypothesized perceptions of media richness and subsequent use of these media were only partially supported. Watson, Ho, and Raman (1994) developed hypotheses based on Hofstede's power distance and individualism dimensions in a study that examined culture's role in the effectiveness of a group support system to effect change in group consensus and distribution of influence within the group. Only 40 per cent of their hypotheses were supported by the study's results. Another study by Tan, Wei, Watson, Clapper, and McLean (1997) examined the role of GSS support in moderating majority influence with American and Singaporean groups. The cultural components of their hypotheses were also based on Hofstede's individualism dimension; only 50 per cent were supported. A similar study by Tan, Wei, Watson, and Walczuch (1998), also run with Singaporeans and Americans, sought to identify cultural effects on CMC's ability to reduce status effects. Again drawing on the power distance and individualism dimensions, to hypothesize about culture's differential effects, 40 per cent of the hypotheses were not supported.

For both researcher and practitioner, the only reliable way to assess the strength of cultural influences on an applied problem such as the suitability of a technology for a particular task is through empirical investigation. Although the subjects in the present exercise come from cultures that differ significantly on most of Hofstede's dimensions, given that such comparisons have rarely yielded much predictive insight in communication/coordination technology-oriented studies like this one, we did not prepare specific directional hypotheses on how members of each culture will differ on their perceptions of the technology and its suitability of the task, satisfaction with process and outcomes, or culture's effects on the quality of the outcomes themselves.

On a more pragmatic level, cultural effects with cross-cultural virtual teams may manifest themselves as differential perceptions of satisfaction with the task, technology, outcomes, and relative contributions of the team members. This may be more likely to occur if members from one culture have significantly more experience with the technologies than do those of the other culture. This may also occur if task communication is conducted in the first (native) language of one member but not the other. In the present study, all communication was in English, the

first language for all of our U.S. subjects but for none of our Mexican subjects. The traditional technology for virtual team support is the telephone, and its use requires real-time verbal fluency in the language used. CMC, as used in the present asynchronous manner, however, allows participants more time to properly construct and edit their written communication, and may represent an advantage for those who are not communicating in their first language. Given the ease with which U.S. subjects can communicate in English via e-mail relative to their Mexican teammates, we can expect that they may send more messages and/or messages of greater length. This may impact perceptions of relative ability and contribution.

4. METHOD

Subjects

Twenty American MBA students from the University of North Carolina at Greensboro and twenty Mexican MBA students from the Instituto Tecnologico y Estudios Superiores de Monterrey (ITESM) Graduate School of Business in Mexico City voluntarily participated in the study. Subjects posted brief descriptions of themselves (age, professional and personal interests) to a website devoted to supporting the exercise. On the basis of this information, subjects sent messages via Email to desired candidates from the other country until pairings were ultimately decided upon. They then undertook the task.

Task

Dyads created a five-page strategic plan for the implementation of a joint MBA international business capstone course that establishes strong international bonds between the students of both institutions. The task was quite complex, entailing the planning of one-week visits by students from one campus to the partner's and vice versa. This required decisions about itineraries, desired lectures, and site visits in each location. This required extensive information exchange, with one partner advising the other as to desirable points of interest and lectures available in their respective locations.

Team members generated ideas, made decisions, and created a common strategic course through Email-based correspondence. They also had access to a project coordination guide, which was a website with project guidelines, timelines, updates, and the postings of all participants and information on their respective institutions and host cities. The website also had a link to a site maintained by Knoll (1996) that featured suggestions for developing virtual collaboration skills such as organization, role playing, developing the deliverable, expression with typed text, tips on cross-cultural communication, and tips on coping with technology. The task spanned four weeks; students were instructed to allocate approximately 15 hours per week to the task.

Procedure

Subjects completed a pretest questionnaire after selecting their partner, but prior to any task-based interaction with him or her. Participants then went to the website, read and/or downloaded task instructions. Participants worked independently and together in an iterative fashion until the project was completed. Dyads were instructed to keep records of all messages sent and received. These were turned into their respective professors (the authors) along with completed pretest and posttest questionnaires and the final deliverable.

Technologies

Participants used electronic mail (Email) to communicate with each other. They were free to use any account they maintained, through work or through their respective universities. As noted above, the task was supported by the use of a website, where task information included a project coordination guide with project guidelines, timelines, updates, and the postings of all participants and information on their respective institutions and host cities. The website was also linked to Knoll's (1996) website with its guide to developing virtual collaboration skills.

Measures

Language skills and technology experience: Using a six-point Likert scale (0 = none, 5 = a high level) on a pretask questionnaire, subjects reported their ability in writing, reading, and speaking Spanish and English. Another scale asked them to indicate these abilities with any other language. Additional pretest questions asked subjects to report their experience with various computer-based technologies, and to report their professional background.

Perceptions of task, technology, and outcomes: A post task questionnaire asked subjects to report their activities during the formative stage of the exercise. This was composed of nine questions on the number and type of emails sent and received during the process of partner selection. A second post task questionnaire asked 11 questions about quantity and quality of correspondence during the task, as well as opinions of outcome quality, process quality, language-based challenges, and intention to communicate with partner after the task was completed. Seven additional questions asked subjects to report satisfaction with the outcome of the task, satisfaction with international content and accuracy/detail of the final report, hours devoted to the project and time dedicated to communication, and desire to be involved in future virtual teamwork exercises. As noted above, each dyad was required to submit a deliverable upon completion of the task. Each deliverable was graded by the second author.

A final post task questionnaire, using a five point Likert scale (1= strongly disagree, 5 = strongly agree), asked subjects to indicate their agreement with 37 statements regarding a variety of factors having to do with the appropriateness of specific information/communication technologies to support the task, and perceptions of their own and their partner's interaction/performance. These questions addressed technology preferences for various tasks, issues of privacy and security, efficiency, effectiveness, and comparative preference for telephone, Email, and face-to-face formats for supporting virtual collaborative work.

5. INSIGHTS AND RECCOMENDATIONS

The first resource required for this type of exercise is a colleague at a university in another culture who will also find the experience valuable for his or her students. The supporting technologies are quite common and may be augmented with others (e.g., fax, telephone). Most students (particularly MBAs) have some experience in distributed group work and at least some familiarity with the technologies. We did not encounter any technology problems during the course of this study, nor did we have any students who had difficulty with either email or a web browser. All dyads successfully completed the exercise and turned in the required deliverable.

The exercise turned up an interesting variety of anticipated and unanticipated results. Although we are not presenting our formal findings here, we did see some interesting differences in posttask perceptions of the task processes, outcomes, and technologies. In general, the Mexicans held more positive perceptions of equality of contribution to the task, satisfaction with the deliverable, and more enthusiasm for the technologies used in this role. Our pretest background questionnaire revealed that the Mexican and U.S. subjects were very much alike in their profile as middle managers in large corporations and their experience with various types of information/telecommunications technologies. The Mexicans received nearly twice the volume and frequency of messages compared to the Americans, though whether this was due to cultural factors (such as differential ability with writing English) or more pragmatic matters such as more or less access to the technologies, is unclear. It is also interesting to note that the majority of our Mexican subjects worked for multinational firms (many American) and presumably had at least some experience working with organizational members from other cultures (e.g., the U.S.). One drawback to the exercise is that we did not specifically ask participants about their level of experience with cross-cultural work.

Our selection of model and theoretical underpinnings and measures can of course be modified to suit particular needs of the classroom application. The exercise may also use a different deliverable (an international marketing plan, for example).

6. CONCLUSION

The economic incentive to utilize CMC technologies to support collaborative work instead of requiring team members to travel for a traditional face-to-face meeting is often significant, and becomes more compelling as distances increase. Electronic mail supports asynchronous communication for virtual teams, but it can now be augmented (or even replaced) by Web-based CMCs that support inexpensive and virtually free real time interaction. Real time interaction is not only supported by the Internet's infrastructure but is being utilized by organizations reaching out to their workers, business partners and customers. Real time collaboration tools are proliferating and adoption is growing rapidly.

The real time collaboration (RTC) marketplace is made up of three interlocking technologies: audioconferencing, dataconferencing and videoconferencing. RTC was a $6.2 billion dollar market in 1999. Worldwide, audioconferencing will represent a $2.3 billion industry this year, while videoconferencing (counting both room-based and desktop figures) has a value of $3.4 billion. These segments are respectively growing at 19% and 25% annually. Sales channel revenues were factored into the videoconferencing estimates since most vendors pass through a channel partner before reaching the customer. The teleconferencing estimate accounts for service provider revenues only, and does not include hardware sales (such as bridges, switches and PBXs). The dataconferencing market is growing at a much faster rate that the other two segments of RTC. The average annual growth rate between 1998 and 2002 for data sharing is estimated to be 64%. The growth rate between 1998 and 1999 is an astounding 111%. In 1999, dataconferencing vendors and their channel partners comprised a $550 million market. This is estimated to grow to $1.8 billion by 2002, with a total of 12.9 million users and 35,750 corporate or other organizational deployments (Collaborative Strategies, 1999).

Both electronic mail (Email) and the Internet are common in transnational business organizations. The two CMC technologies used in the present study are based on these two infrastructures and use their popular and robust protocols. From the results of this study, organizations in the United States and Mexico can give increased consideration to using CMC technologies to support virtual teams composed of people from both cultures.

However, before creating cross-cultural virtual teams, managers should realize that differing levels of facility

with a chosen language, as well as the amount of experience team members may have with this work style may bear upon how well the technology is perceived to support the team's tasks and may also affect perceptions of member competence and contribution to the task. Considering the ubiquity of transnational business organizations, the increasing popularity of team work, and the existence of technologies that can support geographically dispersed and both synchronous and asynchronous collaboration, the business community will likely want to have college graduate recruits (as well as extant employees) who are familiar with the technological, collaborative, and cultural aspects of cross-cultural virtual teamwork. The present exercise is a step in that direction.

7. NOTE

[1]The terms "team" and "group" are used interchangeably in this paper, although they are not strictly synonomous. Hollenbeck et al. (1997) consider groups to be configurations of two or more interdependent individuals who interact over time, and teams to be special cases of groups, whose members incorporate skill differentiation and share a common fate (i.e., similar consequences for all members depending on success or failure at the team level). Brannick and Prince (1997) also distinguish teams from groups by their members having distinct and noninterchangeable functions. We believe that most work teams--virtual and otherwise--do meet these criteria, but we will occasionally substitute the other term as it is the common appellation for the work units supported by groupware. These technologies might be more accurately called "teamware" when used accordingly. In addition, there is much more relevant research on groups (as it has been an accepted term for much longer) than there is strictly on "teams". For much of this research (and this study), the groups can also be considered teams.

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