

# DETERMINANTS OF EFFECTIVE LEADERSHIP IN INFORMATION SYSTEMS DEVELOPMENT TEAMS: AN EXPLORATORY STUDY OF FACE-TO-FACE AND VIRTUAL CONTEXTS

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## ABSTRACT

*In this paper, we identify characteristics/behaviors of effective information systems development (ISD) team leaders/managers. Our exploratory analysis of United States (US)-US face-to-face (FTF) and US-Norway virtual teams reveals that FTF and cross-cultural virtual ISD team-members value different ingredients of leadership in different phases of the ISD project. Further, within virtual ISD teams, national culture plays a role in determining what is considered effective leadership. We conclude that while the behavioral and trait approaches are dominant in explaining effective leadership, other leadership theories must also be considered. The paper concludes with actionable suggestions for guiding leadership in FTF and virtual teams.*

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## INTRODUCTION

As organizations transition from traditional hierarchical structures to flatter, more team-based structures (Kayworth and Leidner 2002), the role and function of leadership is thought to be changing as well

(Nugren and Levine 1995; Zigurs 2003). Prior research reveals that the nature of leadership in team environments is quite complex (Horner 1997). For instance, leadership may rotate among and between team members over time (Lipnack and Stamps 1999). Alternatively,

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leaders may emerge from within the boundaries of the team over time (Wilson, George, and Wellins 1994; Zigurs 2003) or in some cases may simply be selected *a priori*. In the context of project teams, the phrases *assigned project manager* and *project leaders* have been used interchangeably (Thomas and Pinto 1999; Sotiriou and Wittmer 2001). Researchers argue that “the skills and qualities of leadership” required in project teams are significantly different from the traditional settings. On a similar note, Millikin (1994) argues that, “as more organizations are looking at self-managed work teams as a way of doing business, questions arise [as to] what leadership style is [most] effective...”

The uncertainty surrounding team-based leadership becomes even more daunting when one considers virtual teams, which are neither fixed in composition nor static in terms of location of team members (Townsend, DeMarie, and Hendrickson 1997). Traditionally, theories of leadership have been posited and tested within the context of face-to-face environments (Bass 1981). With the movement toward virtual teams in recent years (Townsend, DeMarie, and Hendrickson 1997), especially for ISD projects (Sarker, Sarker, Nicholson, and Joshi 2005; Sarker, Lau, and Sahay 2001), it has become necessary to revisit leadership theories within these new work structures and organizational environments (Powell, Piccoli, and Ives 2004). However, to date, only a handful of studies have been undertaken in the context of information systems (e.g., Bell and Kozlowski 2002; Cascio and Shurygailo 2003; Kayworth and Leidner 2002; Misiolek and Heckman 2005; Zaccaro and Bader 2003; Zigurs 2003). Moreover, with the exception of Kayworth and Leidner (2000), there exists a paucity of research investigating multiple, viable leadership perspectives in the context of virtual teams. This paper attempts to fill this void by exploring four different leadership perspectives – Power-Influence Approach, Trait Approach, Behavior Approach, and Situation Approach – in analyzing effective leadership characteristics of ISD leaders/managers within the context of cross-cultural virtual teams and traditional face-to-face teams.

## CONTRIBUTION

This paper contributes to the information systems (IS) literature by applying organizational leadership theory within the context of face-to-face and cross-cultural virtual information systems development (ISD) teams. The paper informs practice by identifying specific leadership factors (traits, behaviors, situations, and power) which practitioners may employ to more effectively manage both co-located and geographically dispersed (i.e., virtual) team members. By identifying the effective leadership characteristics and behaviors within differing team contexts, face-to-face and virtual (including cross-cultural), we provide some insight into what constitutes effective leadership of contemporary ISD teams.

Further, this is also one of the few studies to qualitatively examine the applicability of traditional organizational leadership theories in the context of FTF and virtual ISD teams. The study provides evidence that effective leadership characteristics and behaviors depend not only on the team context, but also on the national cultures involved, and the project phase. The findings, albeit preliminary, are expected to be of interest to both researchers and practitioners.

This paper reports the exploratory findings regarding (1) the purported frequencies of four salient leadership perspectives as they relate to effective leadership; and (2) the observed trends regarding the extent to which these leadership perspectives vary across the contexts of face-to-face and cross-cultural virtual ISD teams. Further, given that virtual teams are often composed of members from different cultures, the paper also seeks to compare whether the salient leadership perspectives and their relationship to effective leadership differs across the cultures. The paper is organized as follows. First, a review of the literature on teams/virtual teams, culture, and leadership is presented. Next, the methodology adopted in the study is described. Following this, the results, limitations, and directions for future research and practical guidelines for

leading/managing both co-located and geographically distributed team members are discussed.

## **BACKGROUND AND LITERATURE REVIEW**

### **Traditional and Virtual Teams**

Organizational teams can have different forms. Traditional teams can be defined as a collection of individuals who frequently meet face-to-face, are interdependent in their tasks, who share responsibility for outcomes, and who see themselves and are seen by others as an intact social entity embedded in a larger social system (Cohen and Bailey 1997).

Virtual teams on the other hand can have different configurations. While they are similar to traditional face-to-face teams in many respects, their primary difference lies in the fact that members of such teams are distributed across different locations. Pure virtual teams consist of members all of whom are geographically (and often culturally) dispersed, who “never meet face-to-face” (Griffith, Sawyer, and Neale 2003, p. 268), and leverage various types of telecommunication and information technologies to accomplish organizational tasks (Townsend, DeMarie, and Hendrickson 1997; Lipnack and Stamps 1999; Jarvenpaa and Leidner 1999; Saunders 2000). However, some virtual teams may have hybrid configurations, where while the overall team may be distributed and virtual, some members (owing to geographic proximity) may have face-to-face interactions (Griffith, Sawyer, and Neale 2003). Such hybrid configurations are becoming increasingly common in organizations (e.g., Carmel 1999). In this study, we thus focus on such hybrid virtual teams.

### **Culture**

Hofstede (1980, p.25) defines culture as, “the collective programming of the mind which distinguishes the members of one human group from another.” Erez and Shils (1993) describe culture as the shared values of a particular group of people. Walsham (2001) indicates that different cultures help construct individual views and values on how one should communicate, share, work (including

style, method, and effort), coordinate, and keep time.

Hofstede (1980) and Hofstede and Bond (1988) have identified five dimensions of culture including: 1) *power distance*, focusing on the extent to which the less powerful expect and accept that power is distributed unequally; 2) *individualism-collectivism*, focusing on the degree to which the society reinforces individual or collective achievement and interpersonal relationships (highly individualist cultures believe individual is the most important unit, whereas highly collectivistic cultures believe group is the most important unit); 3) *uncertainty avoidance*, focusing on the degree to which the society reinforces, or does not reinforce, uncertainty and ambiguity within the society; 4) *masculinity-femininity*, focusing on the extent to which a society emphasizes achievement or nurturing (masculinity emphasizes ambition, acquisition of wealth, and differentiated gender roles, whereas femininity stresses caring and nurturing behaviors, sexual equality, environmental awareness, and more fluid gender roles); and 5) *confucian-dynamism*, focusing on the selective promotion of a particular set of ethics found in Confucian teachings including thrift, perseverance, a sense of shame, and following a hierarchy.

Among these five dimensions of culture, there is “growing acceptance” of individualism/collectivism as being one of the key dimensions for understanding “cross-cultural differences in attitudes, values, norms, and behavior” (Azevedo, Drost, and Mullen 2002, p. 25; Triandis 1995). As a result, a number of prior studies in the areas of IS (e.g., Dafoulas and Macaulay 2001; Watson, Ho, and Raman 1994), Human Communication (e.g., Oetzel 1998), and Management (e.g., Chen, Chen, and Meindl 1998) have drawn upon individualism / collectivism to understand cross-cultural differences in the workplace.

Similarly, masculinity/femininity has also been found to have important implications in the workplace, especially related to perceived effective leadership behavior (Yan and Hunt 2005; Hofstede 2001). In high masculine cultures, members’ tend to be assertive, ambitious, with a greater need to be

a leader (Hofstede 2001). Prior research also suggests that followers' perceptions of effective leadership behaviors also tend to differ with varying levels of masculinity/femininity of their national cultures (Yan and Hunt 2005).

Given that the virtual teams used in the current study involved two cultures with substantial differences in masculinity / femininity (Hofstede 1980), we have chosen to include this dimension, in addition to the commonly used individualism / collectivism dimension in understanding cross-cultural leadership.

### **Leadership**

Definitions of leadership usually assume that the context involves the interaction between two or more people. Hemphill and Coons (1957, p.7) define leadership "as that behavior of the individual when he is directing the activities of a group toward a shared goal." Cartwright and Zander (1960, p. 492) see leadership as the "performance of those acts which help the group achieve its preferred outcomes."

Kayworth and Leidner (2002), in their work on leadership in virtual teams, identify that most leadership traditions can be categorized within the trait theory, the behavioral perspective, and the contingency theory. In addition to these three perspectives, this paper identifies a fourth approach to leadership, the power-influence approach, which has often been cited in organizational literature as an important leadership tradition. The next section provides a short review of each of these perspectives.

### **Trait-Theory Approach**

The proponents of the trait theory of leadership focus on personality characteristics of individuals that separate leaders from non-leaders. The majority of research under this theory has concluded that intelligence is one of the major differentiating factors between leaders and non-leaders (Bass 1981). Other trait factors such as scholarship, social participation, responsibility, self-confidence, and socio-economic status are also seen as differentiating factors between leaders and non-leaders (Bass 1981). Kirkpatrick and Locke (1991) found that the traits pertaining to

leadership can be divided into several broad categories including drive and leadership motivation.

### **Behavioral Approach**

Researchers following the behavioral approach have focused on studying the behaviors that differentiate effective leaders from non-effective leaders. The Ohio State Studies proposed that leaders exhibit two types of behaviors, namely, consideration (i.e., the extent to which the leader develops mutual trust and focuses on subordinate's well-being) and initiating structure (i.e., the extent to which a leader defines and structures his/her role and those of subordinates towards task performance and goal attainment) (Fleishman 1973).

### **Situational Approach**

The situational approach to leadership suggests that an emergence of a leader is the result of time, place, and circumstance. Cartwright and Zander (1960) suggest that effective leaders are those who are sensitive to the changing environment of the group and are able to adapt their behavior flexibly to the new requirements. The situational approach to leadership is similar to Fiedler's Contingency Theory, which also argues that the effectiveness of a leader's behavior "is contingent upon the demands imposed by the situation" (Bass 1981, p. 32).

### **Power-Influence Approach**

The power-influence approach attempts to explain leadership effectiveness in terms of the amount of power possessed by a leader, the types of power, and how power is exercised (Yukl 1989). French and Raven (1959) argued that five different types of power may enable leadership. They are: reward power (ability to reward another individual(s)), coercive power (use of a direct or indirect force in the case of a failure to conform to the demands of the leader), legitimate power (due to status or rank), referent power (power of an individual to attract another individual towards it), and expert power (knowledge of an individual that receives significant regard and acknowledgement from others). In recent times, Fisher and Ellis (1990) refined French and Raven's (1959) conceptualization by suggesting that there are essentially two types

of power: structural (due to a person's legitimate position), and personal power (due to a person's exceptional qualities such as expertise or knowledge). It is further argued that in ad-hoc egalitarian groups (such as the ones being examined in this study), structural or legitimate power may have a limited influence (Cassel, Huffaker, Tversky, and Ferriman 2006). Thus, in this study, we focus only on the role played by personal/expert power.

In the current study, we explore these four leadership perspectives across both team contexts and cultures. As such, we expect that an individual's team context (i.e., whether they were members of face-to-face vs. virtual environments), as well as his/her national culture (US vs. Norway) will markedly influence the effectiveness of these traditional perspectives as determinants of leadership. That is, we expect the bases of leadership suggested by the four theoretical perspectives to be influenced by team context and culture. Further, we expect the four theories of leadership to play a different role on perceived effective leadership at different phases of the ISD project. The current research proposes a guiding conceptual framework as shown in Figure 1.

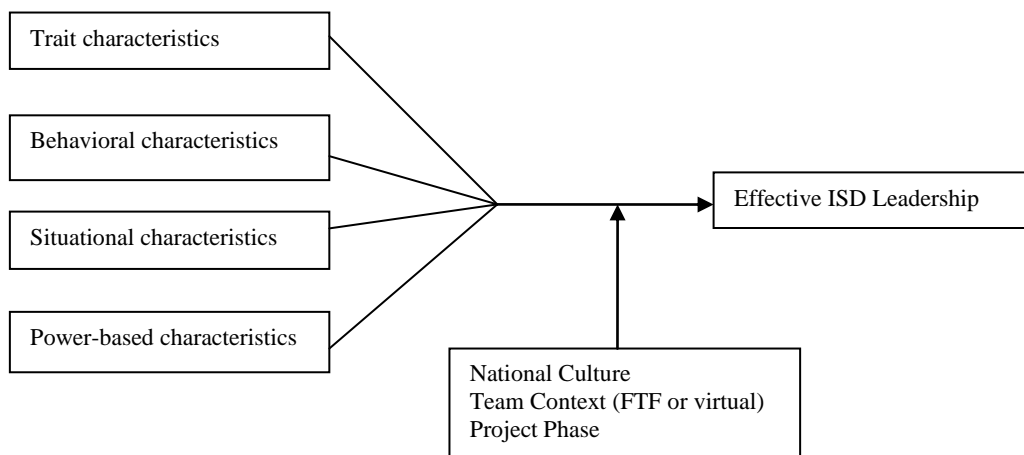
**METHODOLOGY**

In order to explore the applicability of the four leadership perspectives discussed above in cross-cultural virtual and traditional

face-to-face ISD teams, a qualitative research method was adopted. As per common practice within the IS discipline, we draw upon relevant methodological guidelines from various traditions of qualitative research (e.g., Titscher, Meyer, Wodak, and Vetter 2000; Denzin and Lincoln 2000; Flick 1998; Walsham 1995; Miles and Huberman 1994), including case studies (Yin 1994). Our data collection was survey-based, and a systematic qualitative data analysis (as described later) was undertaken on the "text" obtained from surveys completed by respondents.

**Sample**

The sample consisted of both traditional face-to-face (FTF) and cross-cultural virtual (VT) teams. Each of the FTF teams consisted of 4-5 undergraduate students enrolled in a systems analysis and design course in a large US university, who were randomly teamed up with 4-5 graduate students enrolled in a database management course in the same university, resulting in eight teams (65 participants). Virtual teams were comprised of 4-5 undergraduate students enrolled in a systems analysis and design course in a large US university, who were randomly teamed up with 4-5 graduate students enrolled in a similar course in a Norwegian university, resulting in nine teams (63 participants). We provide further details of our sample in Table 1.



**Figure 1: Conceptual Framework**

**Table 1: Sample Demographics**

Demographic Dimensions		FTF Team Participants (65 respondents)	Virtual Team participants (63 respondents)
Gender Distribution		26 females; 39 males	20 females; 43 males
Age Distribution		46 between 18-24 years 12 between 26-34 years 7 between 35-50 years	46 between 18-24 years 15 between 26-34 years 1 between 35-50 years 1 greater than 50 years
Year of Study Distribution		34 Graduate students; 31 undergraduate students	24 graduate students; 29 undergraduate students
Average IS Skills of participants (self-reported on a scale of 1 (non-existent) to 7 (expert))	General Computer Skills	4.85	4.97
	Knowledge of Procedural Programming	3.54	4.06
	Knowledge of Object-oriented Programming	3.56	4.48
	Knowledge of database principles and tools	3.88	4.37
	Knowledge of web-based systems development technologies	3.97	3.83
	Managing large projects	4.78	4.47

**Design**

The FTF teams were required to develop application systems to solve business problems for “real” organizations located in the home state of the US university. Similarly, the virtual teams were required to develop application systems for organizations located in various parts of the world, including the home state of the US university and the home city of the Norwegian university. The instructors of the courses jointly screened each of the projects prior to their commencement, to ensure that they were all fairly equivalent in terms of both scope (i.e., it could be completed within the duration of the semester-long project) and complexity (i.e., the team members had, or were expected to develop, the skills necessary to complete the project within its timeframe).

The communication between the traditional team members occurred primarily through face-to-face interaction, while communication between the US and the Norwegian team-members in the virtual teams occurred primarily through the use of an electronic communication tool (WebCT), which allowed online chats, threaded discussion, and document sharing. The

document sharing feature allowed all participants in the teams to share design artifacts (such as information requirements documents) amongst peers, irrespective of time and location, and enable version control.

**Data Collection**

Data for this study was drawn from questionnaires administered to each of the team members (FTF and VT) at two different stages of the ISD project-- during the initial stage (about three weeks after the start of the project), and towards the end of the project when the development of the information system was in full-swing (during the last two weeks of the project). In the case of both the FTF and the VT projects, the difference between the two data collection phases was about 6-7 weeks. The data collection points corresponded with major project milestones (e.g., the initial phase data was collected around the time when the project proposal was due for the groups). Similarly, the second round of data collection occurred when the final report/prototype was due.

The questionnaires consisted of some open-ended questions. FTF subjects were asked, “In your opinion, what are three characteristics of effective team leaders that

have been/are valuable in the stage of the project that you just completed?” Similarly, VT subjects were asked, “In your opinion, what are three characteristics of effective virtual team leaders that have been/are valuable in the stage of the (virtual team ISD) project that you just completed?” In addition, all team members were asked to name the person whom they thought was the leader of their team. They were instructed to respond with “no leader” if they felt that their team did not have a leader at that point of time (see Appendix 1 for the detailed questionnaire).

In order to ensure the national cultural affiliations of our participants (given our focus on cross-cultural comparisons, especially in the context of the virtual teams), we administered two different questions to the respondents. Specifically, participants were asked to provide their “Country of Origin,” and “The country where you [they] have primarily resided in the last 10 years.” In the case of the FTF teams, while 22 out of 65 participants specified a country other than US as their country of origin, only 11 out of the 65 participants specified a country other than the US as where they have primarily resided in the last ten years. Similarly, in the context of the virtual teams, while 16 out of 63 participants specified a country other than US or Norway as their country of origin, only 9 of them have primarily resided in countries other than US or Norway over the past ten years. We believe that these statistics highlight that the majority of the students were originally from (or had at least resided for a significant duration of time in) the countries whose national cultural differences are being drawn upon in this study.

### Data Analysis

Prior to analyzing the data, researchers sensitized themselves to the four theoretical perspectives discussed in the literature review section. Next, the researchers dynamically created labels for all responses to the open-ended leadership questions (e.g., Titscher, Meyer, Wodak, and Vetter 2000; Flick 1998). When discrepancies arose, a literature-driven analysis (searching the literature for support of ones’ position) was collectively performed, yielding complete agreement for all codeable items (Sarker, Lau, and Sahay 2001). As further subject responses were analyzed, those

responses fitting an existing label were added to that label (incrementing its frequency count), and, when necessary, modifications to the labels were made (to better explain the concept being formed by the aggregation of similar subject responses). The same iterative labeling process was performed for all data sets yielding 113 labels: 57 for the Trait Perspective, 38 for the Behavioral Perspective, 14 for the Situational Perspective, and 4 for the Power-Influence Perspective (see Table 2 for example responses).

Subsequent to the labeling phase, theoretical constructs from each of the four leadership perspectives were identified. Six traits were adopted from Kirkpatrick and Locke (1991) and used as constructs within the Trait Perspective. These include, *drive* (e.g., achievement, ambition), *leadership motivation* (e.g., motivation to lead, develop networks), *honesty-integrity*, *self confidence* (e.g., emotional stability and even tempered), *cognitive ability* (e.g., intelligence), and *flexibility*. Several labels failed to map into any of those categories, so an additional construct was created. We called this construct, consisting of items like congeniality, practicality, humility, objectivity, and time management, “Other Skills/Traits.” Figure 2 summarizes the data analysis process.

*Initiating* and *Consideration* were the constructs identified within the Behavioral Perspective (Fleishman 1973). Similar to Kayworth and Leidner (2002), the present research sometimes found additional behaviors that were associated with project leaders. These behaviors were categorized under a newly created construct called “*Other Behaviors*.”

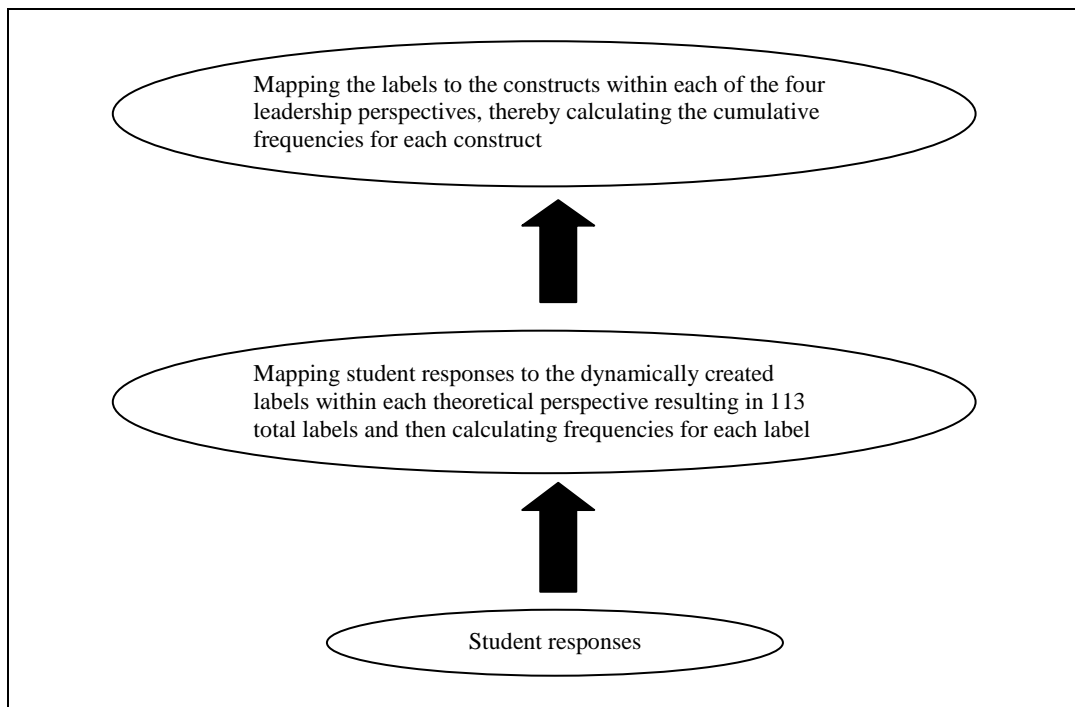
For the Situational Perspective, a new construct called *Contextual Basis* was created to capture all responses (including traits and behaviors) that were seen as specific to the project itself.

As discussed earlier, we utilized the category of *expert/personal power* (e.g., Fisher and Ellis 1990) which encompasses both technical and ISD project management knowledge (Sarker, Sarker, Nicholson, and Joshi 2004; Basselier, Reich, and Benbasat 2001), as the sole construct within the power-influence perspective.

**Table 2: Examples of Participant Responses**

<b>TRAIT APPROACH</b>	<b>SAMPLE COMMENTS</b>
Drive	Goal Oriented, Hard Working, Aggressive, and Persistent
Leadership Motivation	Inspirational, Ability to Motivate, Coordinating Skills, and Organizing Skills
Honest-Integrity	Trustworthy, Responsible, Honesty, and Ethical
Self-Confidence	* Confident
Cognitive Ability	Decision Making Skills, Smart, Problem Solver, Intelligent, and Attentive to Details
Flexible	* Compromising and Flexible
Other Skills/Traits	Communication Skills, Practicality, Humility, Objective, Understandable, Time Management Skills
<b>BEHAVIORAL APPROACH</b>	
Consideration	Relationship Management, Inclusiveness, Positive Supporting Attitude, Managing Diversity, and Motivating Others
Initiating Structure	Delegating Work, Managing Accountability, Controlling, Organizing and Planning Time, Keeping Everyone On Task
Other Behaviors	Communication, Communicate and Articulate Consequences, and Respond Quickly
<b>SITUATIONAL APPROACH</b>	
Contextual Basis	Respond to Project Crisis, Knowledge of Client, Dedicated to the Project, Committed to the Project, Knowledge about the Project
<b>POWER APPROACH</b>	
Expert Power	Expertise, Knowledge about ISD, Technical Knowledge, Technical Expertise, Technical Background, Knowledge of the Business, and Competent

Note: \* represents categories with extremely low frequencies



**Figure 2: Data Analysis Process**



The original labels were next mapped to the constructs within the four perspectives of leadership (discussed above), and frequency counts for each of the constructs were calculated. All frequencies were then converted into relative frequencies allowing analysis across groups. In the analysis, comparisons were made between the face-to-face and virtual team members from the US and between the US and Norwegian cultures within the virtual teams in the initial (T1) and later (T2) stages.

In the next section, the results of the above-mentioned data analysis are presented.

**RESULTS**

Figure 3, helps clarify the nature of comparisons presented in this section. The differences in perceptions between US team members working in a face-to-face environment with other US team members and US teams working in a virtual environment (with Norwegian team members) are presented in Table 3a. The differences in perceptions between the US and Norwegian team members working in the cross-cultural virtual environment are presented in Table 3b.

**Face-to-Face and Virtual Teams**

Differences emerged between virtual and face-to-face teams in terms of the trait perspective of leadership, especially in the second time period, where US members in virtual teams seemed to believe less in the importance of traits in leader emergence when compared to face-to-face teams. This difference was, however, primarily due to the

differences in the “drive” construct. That is, face-to-face team members felt that an individual who had the energy and the ambition would be an effective leader.

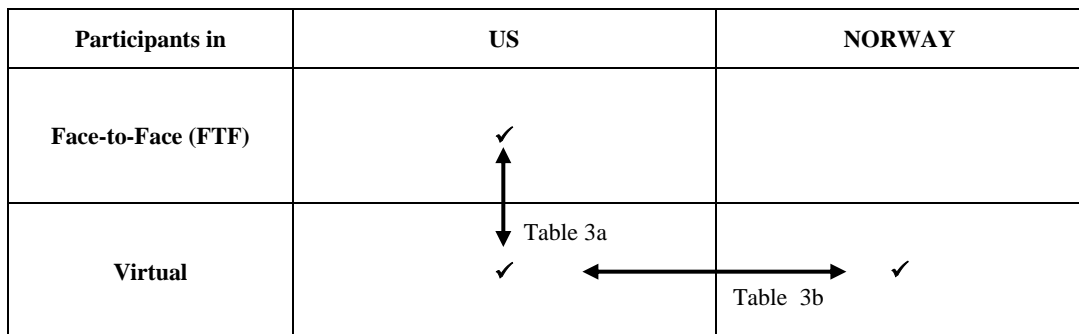
There was also a difference in terms of the behavioral perspective. Behavioral totals went up in the second time period for the virtual teams, while they went down for the face-to-face teams. Further analysis revealed that the increase for the US-VT was primarily due to an increase in the initiating structure construct from T1 to T2, while the reduction for the US-FTF was primarily due to a decrease in the consideration construct from T1 to T2.

Differences were also noticed between virtual and face-to-face teams in terms of the situational approach. Unlike virtual teams, the face-to-face teams seemed to value the construct of situation for effective project leadership more so as the projects progressed into their later stages.

The analysis showed differences between these two types of project teams in terms of the importance of the power-influence approach of leadership in the first time period only, with the virtual teams assigning higher importance to expert power.

**Within Virtual Project Teams- Comparing US and Norwegian Cultures**

Within the Trait Approach, differences were found between US and Norway trait totals for both time periods. The importance of traits for both US and Norway declined from T1 to T2, but the incremental differences



**Figure 3: Nature of Comparisons Made in This Study**

**Table 3a: Comparing Perceptions of US Participants Of FTF And Virtual Teams**

	US PARTICIPANTS OF VIRTUAL TEAMS (sample size = 41)		PARTICIPANTS OF FTF TEAMS (all from the US) (Sample size= 65)	
	Time 1	Time 2	Time 1	Time 2
<b>TRAIT APPROACH</b>	<b>40.86%</b>	<b>34.04%</b>	<b>41.18%</b>	<b>39.02%</b>
Drive	4.30%	4.26%	4.71%	12.20%
Leadership Motivation	8.60%	11.70%	15.29%	6.10%
Honest-Integrity	5.38%	7.45%	5.88%	10.98%
Self-Confidence	1.08%	0.00%	2.35%	0.00%
Cognitive Ability	4.30%	3.19%	2.35%	1.22%
Flexible	1.08%	1.06%	1.18%	0.00%
Other Skills/Traits	16.13%	6.38%	9.41%	8.54%
<b>BEHAVIORAL APPROACH</b>	<b>34.41%</b>	<b>41.49%</b>	<b>42.35%</b>	<b>32.93%</b>
Consideration	11.83%	6.38%	9.41%	3.66%
Initiating Structure	13.98%	23.40%	22.35%	20.73%
Other Behaviors	8.60%	11.70%	10.59%	8.54%
<b>SITUATIONAL APPROACH</b>	<b>9.68%</b>	<b>9.57%</b>	<b>7.06%</b>	<b>13.41%</b>
Contextual Basis	9.68%	9.57%	7.06%	13.41%
<b>POWER APPROACH</b>	<b>15.05%</b>	<b>14.89%</b>	<b>9.41%</b>	<b>14.63%</b>
Expert Power	15.05%	14.89%	9.41%	14.63%

Note: *Other Skills/Traits*- e.g., congenial, practical, humility, objective, time management

*Other Behaviors*- Some additional behaviors were identified that did not fit the *Consideration* and *Initiating* constructs (e.g., communication, communicate and articulate consequences, and respond quickly)

*Contextual Basis*- Project related context (e.g., crisis management, dedication, commitment to the project)

*Expert Power*- e.g., information systems development skills, technical skills

between the two groups remained relatively constant (approximately 8%). Further analysis indicated that the differentials were primarily due to differences in Leadership Motivation, one of Locke’s constructs, and in one additional trait construct introduced during the current research, Other Skills/Traits.

In analyzing the relative frequencies for the Behavioral Approach, differences in behavior totals were found between US and Norway in T1. Further analysis indicated that the differences were primarily due to the initiating structure construct, with US assigning less value to the construct for effective project leadership.

The analysis for the Situational Approach showed differences in situational totals between US and Norway in both T1 and

T2. Norwegian virtual team members believed that an individual who adapts successfully to the current situation, has a better overview of the project, and initiative and time commitment to the project, would be an effective leader.

Analysis of the Power-Influence Perspective yielded differences in power-influence totals between US and Norway in T1, with US virtual team members seeing a leader as one who possesses expert power in terms of ISD and technical knowledge.

Finally, all subjects were asked to identify who they thought was the leader in their team. At T2, 76% of FTF participants identified a leader, 91% of US-VT participants identified a leader, and only 47% of Norwegian-VT participants identified a leader.

**Table 3b: Comparing Across Cultures Within Virtual Teams**

	US PARTICIPANTS (Sample size = 41)		NORWEGIAN PARTICIPANTS (Sample size = 22)	
	Time 1	Time 2	Time 1	Time 2
<b>TRAIT APPROACH</b>	<b>40.86%</b>	<b>34.04%</b>	<b>32.26%</b>	<b>26.44%</b>
Drive	4.30%	4.26%	3.23%	2.30%
Leadership Motivation	8.60%	11.70%	6.45%	4.60%
Honest-Integrity	5.38%	7.45%	9.68%	5.75%
Self-Confidence	1.08%	0.00%	0.00%	0.00%
Cognitive Ability	4.30%	3.19%	1.08%	1.15%
Flexible	1.08%	1.06%	1.08%	0.00%
Other Skills/Traits	16.13%	6.38%	10.75%	12.64%
<b>BEHAVIORAL APPROACH</b>	<b>34.41%</b>	<b>41.49%</b>	<b>41.94%</b>	<b>42.53%</b>
Consideration	11.83%	6.38%	11.83%	9.20%
Initiating Structure	13.98%	23.40%	20.43%	22.99%
Other Behaviors	8.60%	11.70%	9.68%	10.34%
<b>SITUATIONAL APPROACH</b>	<b>9.68%</b>	<b>9.57%</b>	<b>18.28%</b>	<b>18.39%</b>
Contextual Basis	9.68%	9.57%	18.28%	18.39%
<b>POWER APPROACH</b>	<b>15.05%</b>	<b>14.89%</b>	<b>7.53%</b>	<b>12.64%</b>
Expert Power	15.05%	14.89%	7.53%	12.64%

*Note:* Other Skills/Traits- e.g., congenial, practical, humility, objective, time management  
Other Behaviors- Some additional behaviors were identified that did not fit the *Consideration* and *Initiating* constructs (e.g., communication, communicate and articulate consequences, and respond quickly)  
Contextual Basis- Project related context (e.g., crisis management, dedication, commitment to the project)  
Expert Power- e.g., information systems development skills, technical skills

## DISCUSSION

The differences identified in the data analysis section highlight the divergent characteristics identified by the different groups, at different points in time, as to what exemplifies an effective leader within a given context (FTF and VT). Some broad patterns are: 1) Trait approach seems important more for US than Norway, 2) Behavioral approach is prominent for all contexts, 3) Situational approach is relatively less important, though it is more prominent in FTF-US and Norway (within the virtual teams), and finally, 4) Power approach has low explanatory power, particularly among Norwegians.

In the following two sub-sections, the aforementioned patterns are discussed in greater detail. Specifically, we explore the underlying factors believed to be influencing what is, and what is not, perceived to be effective leadership characteristics. Further, based on the analysis results and our review of

the literature, we also develop certain actionable suggestions (see Tables 4a and 4b) that we believe will enable both traditional and virtual ISD team leaders to be more effective.

### Face-to-Face and Virtual Teams

US-VT members assigned less importance to traits than FTF members. Because virtual team environments rely on surrogates to bridge time and space, a person's behavior, when compared with their traits, may become a more salient indicator or metric for identifying effective leaders. Further evidence supporting this virtual team shift can be seen by looking at T2, in which behavioral values for all virtual teams were higher in comparison to any of the other four perspectives.

The behavioral approach became more important for US-VT members in T2 and less important for FTF members in T2. In the highly interactive and interpersonal FTF

environment, initiating and consideration constructs are quite important in establishing the group structure and norms, but as the group moves into the performing stage, less emphasis needs to be placed on the behavioral structure as the group’s interactions become routine and implicit. In the VT environments, the constant separation, especially in the performing stage, creates a heightened and continuous need for confirming and reaffirming that each individual is on task, doing well, and progressing toward the goal; whereas in the FTF environment, these behaviors are physically observed, placing less cognitive resources and salience on maintaining initiating and consideration activities.

The FTF members placed more importance on the situational approach as projects progressed into their later stages. When the project deliverable deadlines drew closer, the highly interactive FTF environment may have created circumstances in which higher emphasis given to the circumstances under which a leader was performing, thereby making his/her behaviors ‘inseparable’ from that situation.

The differences between US-VT and US-FTF in terms of the power-influence approach in T1 may have been due to the salience of the situation. In the US-VT group, a person’s expertise may have had higher

salience in the leaner VT environment. By contrast, FTF groups may have been concentrating on each other’s behaviors, leaving less emphasis on expertise.

The US-VT members observed a leader more often than the US-FTF, suggesting that the VT environment created a need for hierarchical leadership. In face-to-face environments, tasks, including who is responsible for them, are known and can be physically verified in a continuous fashion, whereas virtual team environments may call for higher levels of structure (i.e., where explicit instructions and guidelines need to be provided by higher authorities), to effectively overcome the lack of group proximity and reciprocity.

To summarize, it may be argued that in the FTF teams, behaviors are key for establishing effective leadership, especially in the initial phases. Further, it is also important for the leaders to continuously modify their style/behaviors with the situation at hand. The virtual team members also emphasized the role of leader behaviors (especially during the later stages), but also emphasized that leaders need to be experts in the task at hand in order to be effective. We summarize these differences in the perceptions of FTF and virtual team members in the form of actionable suggestions guiding leadership in both FTF and virtual teams (see tables 4a and 4b).

**Table 4a: Ingredients for Effective FTF ISD TEAM Leaders**

<p><u>Behavior management</u>                  In order to portray a positive valence within the team, the leader should manage his/her behavior in a way that is consistent with the team as a whole, as opposed to exhibiting behavior that is consistent with some individual members only.</p> <p><u>Be a facilitator and motivator</u>                  Be willing to assume responsibility, motivate team members to put their best into the project, empower others, and facilitate smooth relationship building amongst team members in the early stages of the project.</p> <p><u>Keep focused on the task at hand at all stages of the project</u>                  While relationship building is important in any project team, the rich medium in which the traditional ISD project teams perform fosters a positive environment within the team. The responsibility of the project leader should hence primarily be on keeping the team focused on the task at hand at all stages of the project.</p> <p><u>Change leadership style based on the need of the team</u>                  Focus always on ‘rising to the occasion’ and changing the leadership style based on the situation, be it in conflict resolution, or dealing with any other crisis.</p> <p><u>Be a performer in the ISD project towards the later stages, when “production” is in full swing</u>                  An effective traditional ISD project leader should spend the first half of the project in organizing and in facilitation, and focus on being a performer of tasks (such as creation of the final deliverable) towards the latter half of the project only.</p>
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**TABLE 4b: Ingredients for Effective Virtual ISD TEAM Leaders**

<p><u>Think team wise, but focus on each member</u></p> <p>Be sensitive to the fact that in virtual project teams, there may be significant cultural differences amongst its members, and try to manage these cultural differences by focusing on the needs and value systems of individual members, as opposed to the entire team.</p> <p><u>Continuous nurturing (task and social-related) of the team</u></p> <p>The virtual ISD project team leader should keep a dual emphasis by continuously nurturing member relations with empathy and altercentricism, and at the same time keeping the team focused on the task at hand, namely the creation of the system, at all stages of the virtual team project.</p> <p><u>Be practical and manage time efficiently</u></p> <p>Virtual teams involved in ISD are temporary structures that are very focused on the development of the information system application and have tremendous constraints in terms of time. The role of a virtual project team is hence to remain practical in terms of the goals set and the deliverables promised, and manage the time allocated to each task efficiently and effectively.</p> <p><u>Match the context</u></p> <p>Adjust the style of leadership and the nature of actions to be taken depending on the situation at hand. In other words, be “inseparable” from the virtual context.</p> <p><u>Be an expert</u></p> <p>The role of a virtual project team leader is not only to facilitate the team, but also to be an expert in ISD project management techniques, client management, and in other functional areas related to the project, such that his/her contribution to the team is significantly more than other team members.</p>
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**Within Virtual Teams - Comparing US and Norwegian Cultures**

Within the Trait Perspective, a consistent difference of approximately 8% was found between Norwegian and US-VT groups. Not only did the Norwegians identify less with the Trait Perspective when compared to the other three perspectives, they identified with Leadership Motivation and Other Skills/Traits quite differently from their US counterparts. For example, US-VT had three times as many responses for the Leadership Motivation construct, consisting of personal and social power motives, than the Norwegians at T2. Whereas, twice as many Norwegians identified with Other Skills/Traits construct consisting of congeniality, practicality, humility, objectivity, and time management than US-VT counterparts at T2. The traits falling into the Other Skills/Traits construct support more of a democratic environment, while the traits falling into the Leadership Motivation construct support more of an autocratic environment in which one person is motivated to exert a dominant position within the group (White and Lippitt 1960).

These results can also be explained based on Hofstede’s cultural variable of masculinity and femininity. Hofstede (2001)

argues that cultures that are more masculine value managers/leaders who are ambitious, decisive, aggressive, competitive, just, and firm. In other words, such cultures seem to believe that effective leaders are those individuals who possess autocratic traits/characteristics. On the other hand, cultures that are low in masculinity believe that effective leaders are those individuals who deal with the feelings of others, seek consensus from everyone involved, and are more democratic. These cultures hence seem to value the behaviors of leaders as opposed to the traits. A comparison of cultures of US and Norway revealed that the US is much higher in rank in terms of masculinity (score of 62) and hence attached more importance to the trait theory of leadership as opposed to the Norwegians, whose culture is less masculine (score of 8).

Within the Behavioral Perspective, a differential of approximately 7% was found between US-VT and Norway at T1 (Norwegian individuals yielded the highest percentage), while no differences were found between the two groups at T2. It appears that the differences in the behavioral bases of leadership effectiveness (i.e., higher for Norway than for the US members) in time T1 across the two cultures may be attributed to the

differences in respondents' perceptions regarding the importance of initiating structure.

The difference in terms of the importance attached to the situational approach (Norwegians attached more importance than the US-VT members) can also be explained from the point of view of Hofstede's variable of individualism and collectivism. Cultures that are low on individualism believe that "leadership is inseparable from the context" (Hofstede 2001, p. 245). When compared to the US (individualism score of 91), Norway has a considerably lower score on the individualism scale (69) and hence values the situational approach to leadership more than the US members.

The US-VT members attached more importance to expert power than their Norwegian counterparts, especially in T1. The US-VT members, unable to physically observe the behaviors of the remote Norwegian members in T1, and, involved in forming and norming, may have reverted back to a heuristic of leadership in which anyone with certain attributes or skills was seen as the leader. The Norwegians, with their democratic tendencies and high situational affinities, may have placed less importance in projecting a leader solely based on an individual's expertise.

Clearly, the Norwegian counterparts needed or identified with a leader far less than their US counterparts. Hofstede (2001) argues that cultures that are low on "masculinity" view their leaders/managers as one of themselves. Norway, having a less masculine culture, hence was more reluctant to acknowledge the presence of a leader, when compared to its US counterparts.

## **LIMITATIONS AND FUTURE RESEARCH**

While the study does provide interesting insights, it is important to acknowledge its limitations. First, the study involves dyadic configurations of virtual ISD teams, which are not the only kind of configuration used in distributed ISD teams. Further, the sample sizes were also low, limiting the possibility of statistical analysis,

and making the study exploratory in nature. Second, to gain a complete understanding of leadership effectiveness, we would need to have data from the following: US-US FTF teams, US-US virtual teams, Norway-Norway FTF teams, Norway-Norway virtual teams, and US-Norway virtual teams. In our study, as highlighted in Figure 3, we were only able to utilize US-US FTF teams and US-Norway virtual teams, which could have limited our understanding of this issue. Third, previous research has suggested that the project/task complexity can affect leadership effectiveness. While in this study, the instructors ensured that project complexity across the groups were fairly equivalent, it was not objectively controlled. In other words, we chose to balance "realism" with "control" (Dennis and Valacich 2001). That is, we wanted real feedback, from real team members, involved in real-world information systems development projects that had meaningful consequences for all stakeholders. Finally, the premise underlying this study is that the responses to survey questions by team members represent their actual theories-in-use and not their espoused theories.

Given the relationship between effective leadership and project outcomes (e.g., Cascio and Shurygailo 2003; Hart and McLeod 2003; Zigurs 2003), future research is needed to empirically investigate further the efficacy of the leadership characteristics identified as important herein. Moreover, the relationships between national culture, context, and leadership characteristics should be unearthed.

## **CONCLUSION**

Kayworth and Leidner (2002), in their study of leadership in virtual and face-to-face teams, concluded that there was very little difference between the characteristics of effective leaders in virtual and face-to-face teams. Our preliminary analysis, on the contrary, shows that different characteristics are important for effective leadership in virtual and face-to-face teams. In addition, we found that none of the traditional theoretical perspectives can be exclusively relied upon to explain effective ISD leadership in cross-cultural virtual and FTF teams. What is required is a synthesis of the perspectives.

Results also indicate that context (e.g., FTF, VT), project phase, and national culture are important in determining the appropriate “mix” of, as well as the “magnitude” to which, each of the leadership bases can be used to explain, hence inform, effective leadership in

project teams. Moreover, our findings reveal that virtual managers/leaders must embrace many behaviors, exemplify numerous traits, adapt to countless situations, and exert a range of power types; however, to be successful, they must learn when and with whom to do so.

## REFERENCES

- Avolio, B.J., S. Kahai, and G.E. Dodge, “E-Leadership: Implications for theory, research, and practice,” *Leadership Quarterly*, 2001, 11:4, 615-668.
- Azevedo, A., E.A. Drost, and M.R. Mullen, “Individualism and Collectivism: Toward a Strategy for Testing Measurement Equivalence Across Culturally Diverse Groups,” *Cross Cultural Management*, 2002, 9:1, pp.19-29.
- Bass, B.M., *Stogdill’s Handbook of Leadership: A Survey of Theory in Research*, New York: Harper, 1981.
- Basselier, G., B.H. Reich, and I. Benbasat, “Information Technology Competence of Business Managers: A Definition and Research Model,” *Journal of Management Information Systems*, 2001, 17:4, 159-182.
- Bell, B.S. and S.W.J. Kozlowski, “A typology of virtual teams: Implications for effective leadership,” *Group & Organizational Management*, 2002, 27:1, pp.14-49.
- Carmel, E., *Global Software Teams*, Upper Saddle River, NJ: Prentice Hall, 1999.
- Cartwright, D. and A. Zander, “Leadership and Group Performance: Introduction,” In *Group Dynamics*, Cartwright D. and A. Zander (eds.), Row, Peterson and Company: Evanston, IL, 1960.
- Cascio, W.F. and S. Shurygailo, “E-Leadership and virtual teams,” *Organizational Dynamics*, 2003, 31:4, 363-376.
- Cassell, J., D. Huffaker, D. Tversky, and K. Ferriman, “The Language of Online Leadership: Gender and Youth Engagement on the Internet,” *Developmental Psychology*, 2006, 42:3, 436-439.
- Chen, C.C., X. Chen, and J.R. Meindl, “How can Cooperation be Fostered? The Cultural Effects of Individualism-Collectivism,” *Academy of Management Review*, 1998, 23:2, 285-304.
- Cohen, S.G. and D.E. Bailey, “What makes Teams Work: Group Effectiveness Research from the Shop Floor to the Executive Suite,” *Journal of Management*, 1997, 23:3, 239-290.
- Dafoulas, G. and L. Macaulay, “Investigating Cultural Differences in Virtual Software Teams,” *Electronic Journal of Information Systems in Developing Countries*, 2001, 7:6, 1-14.
- Dennis, A.R. and J.S. Valacich, “Conducting research in information systems,” *Communication of AIS*, 2001, 7:5, July.
- Denzin, N. and Y. Lincoln, *Handbook of Qualitative Research*, Second Edition, Thousand Oaks, CA: Sage, 2000.
- Erez, M. and P.C. Earley, *Culture, Self-Identity, and Work*, New York: Oxford University Press, 1993.
- Fisher, B.A. and D.G. Ellis, *Small Group Decision Making: Communication and the Group Process*, Third Edition, New York: McGraw Hill Publishing Company, 1990.
- Fleishman, E.A., “Twenty Years of Consideration and Structure,” In *Current Developments in the Study of Leadership*, Fleishman, E.A. and J.B. Hunt (eds.), Southern Illinois Press: Carbondale, IL, 1973.
- Flick, U., *An Introduction to Qualitative Research*, London, UK: Sage Publications, 1998.
- French, J.R.P. and B. Raven, “The Bases of Social Power,” In *Group Dynamics*, Cartwright D. and A. Zander (eds.), Row, Peterson and Company: Evanston, IL, 1959.
- Griffith, T.L., J.E. Sawyer, and M. Neale, “Virtualness and Knowledge in Teams: Managing the Love Triangle of Organizations, Individuals, and Information Technology,” *MIS Quarterly*, 2003, 27:2, 265-287.
- Hart, R.K. and P.L. McLeod, “Rethinking team building in geographically dispersed teams: One message at a time,” *Organizational Dynamics*, 2003, 31:4, 377-387.
- Hemphill, J.K. and A.E. Coons, “Development of the leader behavior description questionnaire,” In *Leader behavior: Its description and measurement*, Stogdill, R.M. and A.E. Coons (eds.), Bureau of Business Research, Ohio State University: Columbus, Ohio, 1957.
- Hofstede, G., *Cultures Consequences: Comparing Values, behaviors, Institutions, and Organizations Across Nations*, Second Edition, Thousand Oaks, CA: Sage Publications, 2001.

- Hofstede, G., *Culture's Consequences: International Differences in Work-Related Values*, First Edition, Beverly Hills, CA: Sage Publications, 1980.
- Hofstede, G. and M.H. Bond, "The Confucius Connection: From Cultural Roots to Economic Growth," *Organizational Dynamics*, 1988, 16:4, 5-21.
- Horner, M., "Leadership Theory: past, present and future," *Team Performance Management*, 1997, 3:4, 270-287.
- Jarvenpaa, S.L. and D.E. Leidner, "Communication and Trust in Global Virtual Teams," *Organization Science*, 1999, 10:6, 791-815.
- Kayworth, T.R. and D.E. Leidner, "Leadership Effectiveness in Global Virtual Teams," *Journal of Management Information Systems*, 2002, 18:3, 7-40.
- Kirkpatrick, S.A. and E.A. Locke, "Leadership: Do traits matter?," *Academy of Management Executive*, 1991, 5:2, 48-60.
- Lipnack, J. and J. Stamps, "Virtual teams: The new way to work," *Strategy and Leadership*, 1999, 27:1, 14-19.
- Miles, M.B. and A.M. Huberman, *Qualitative Data Analysis*, Second Edition, Thousand Oaks, CA:Sage, 2004.
- Millikin, J. P., *The role of self-leadership in empowered work teams*, Arizona State University, Tempe :Unpublished Doctoral Dissertation, 1995.
- Misiolek, N. and R. Heckman, "Patterns of emergent leadership in virtual teams," *Proceeding of the 38<sup>th</sup> Hawaiian International Conference on Systems Sciences*, Big Island, 2005.
- Nygren, R., and E.L. Levine, "Leadership of work teams: Factors influencing team outcomes," *Third University of North Texas Symposium on Work Teams*, Dallas, TX, 1995.
- Oetzel, J.G., "Explaining Individual Communication Processes in Homogeneous and Heterogeneous Groups Through Individualism-Collectivism and Self-Construal," *Human Communication Research*, 1998, 25:2, 202-224.
- Powell, A., G. Piccoli, and B. Ives, "Virtual Teams: A Review of Current Literature and Future Research Directions," *DATABASE*, 2004, 35:1, 6-36.
- Saunders, C.S., "Virtual Teams: Piecing Together the Puzzle," In *Framing the Domain of IT Management: Projecting the Future Through the Past*, Zmud, R.W.(ed.), PinnFlex Education Resources, Inc:Cincinnati, OH, 2000.
- Sarker, S., F. Lau, and S. Sahay, "Using an adapted grounded theory approach for inductive theory building about virtual team development," *DATABASE*, 2001, 32:1, 38-56.
- Sarker, S., S. Sarker, D. Nicholson, and K. D. Joshi, "Knowledge Transfer in Virtual Systems Development Teams: An Exploratory Study of Four Key Enablers," *IEEE Transactions on Professional Communication*, 48(2), 201-218.
- Strauss, A. and J. Corbin, *Basics of Qualitative Research*, Newbury Park, CA: Sage, 1990.
- Titscher, A., M. Meyer, R. Wodak, and E. Vetter, *Methods of Text and Discourse Analysis*, Thousand Oaks, CA:Sage, 2002.
- Townsend, A.M., S.M. DeMarie, and A.R. Hendrickson, "Are you ready for virtual teams?," *HR Magazine*, 1997, 41:9, 122-126.
- Triandis, H.C., *Individualism and Collectivism*, Boulder, CO: Westview Press, 1995.
- Walsham, G., *Making a World of Difference: IT in a Global Context*. New York, NY: John Wiley & Sons Ltd, 2001.
- Walsham, G., "Interpretive case studies in IS research: nature and method," *European Journal of Information Systems*, 1995, 4, 74-81.
- Watson, R.T., T.H. Ho, and K.S. Raman, "Culture: a Fourth Dimension of Group Support Systems," *Communications of the ACM*, 1994, 37:10, 44-55.
- White, R. and R. Lippitt, "Leadership Behavior and Membership Reaction in Three 'Social Climates,'" In *Group Dynamics*, Cartwright D. and A. Zander (eds.), Row, Peterson and Company: Evanston, IL, 1960.
- Wilson, J.M., J. George, and R.S. Wellins, *Leadership trapeze: Strategies for leadership in team-based organizations*. San Francisco, CA: Jossey-Bass, Inc, 1994.
- Yan, J., and J.G. Hunt, "A Cross Cultural Perspective on Perceived Leadership Effectiveness," *International Journal of Cross-Cultural Management*, 2005, 5:1, 49-66.



Yin, R.K., *Case Study Research*, Second edition, Thousand Oaks, CA:Sage Publications, 1994.

Yukl, G.A., *Leadership in Organizations*, New Jersey: Prentice Hall, 1989.

Zaccaro, S.J. and P. Bader, "E-Leadership and the challenges of leading e-teams: Minimizing the bad and maximizing the good," *Organizational Dynamics*, 2003, 31:4, 377-387.

Zigurs, I., "Leadership in virtual teams: Oxymoron or opportunity?," *Organizational Dynamics*, 2003, 31:4, 339-351.

## APPENDIX A: QUESTIONS ADMINISTERED TO THE PARTICIPANTS

1. In your opinion, what are three characteristics of effective team leaders [or virtual team leaders] that have been/are valuable in the stage of the project that you just completed?

i)



ii)



iii)



2. In your opinion, who is/are currently the leader(s) of your entire team? If you believe that there is no leader at this time, say "No Leaders." If you really believe that there are multiple leaders of the entire team, list their names (separated by commas).



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