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Darren Nicholson
Washington State University

Saonee Sarker
Washington State University

Suprateek Sarker
Washington State University

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INGREDIENTS OF EFFECTIVE LEADERSHIP IN INFORMATION SYSTEMS DEVELOPMENT PROJECT TEAMS: AN EXPLORATORY STUDY

Darren Nicholson, Saonee Sarker, and Suprateek Sarker

Washington State University

dbnicholson@wsu.edu ssarker@wsu.edu sarkers@wsu.edu

Abstract

In this paper, we attempt to identify the characteristics/behaviors of effective ISD project team leaders/managers. Our exploratory analysis reveals that FTF and virtual ISD team-members value different ingredients of leadership in different phases of the ISD project. We also conclude that while the behavioral approach is dominant in explaining effective leadership in the different contexts (FTF and Virtual) and in different project phases (initial and later), other leadership theories also need to be considered and synthesized to comprehensively answer the question --what makes an effective ISD project leader/manager.

Keywords: ISD projects, effective project leaders, leadership, project teams, virtual teams

Introduction

As organizations transition from the traditional hierarchical structure to a flatter, more team-based structure (Kayworth & Leidner 2002), the role and function of leadership is thought to be changing as well (Nugren & Levine 1995). According to Horner's (1997) meta-analysis, researchers are having a difficult time trying to understand what leadership entails in team environments. For instance, leadership may rotate among and between team members over time (Lipmack & Stamps 1999). Alternatively, leaders may emerge from within the boundaries of the team over time (Wilson et al. 1994) 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 (Thoms & Pinto 1999; Sotiriou & 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 project team-based leadership becomes even more daunting when one considers virtual teams, which are neither fixed in composition nor static in geography (Townsend et al. 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 et al. 1997), especially for information systems development projects (Sarker et al. 2001), a necessity for revisiting and positioning leadership theories within these new environments is clear. However, with the exception of the work of Kayworth and Leidner (2002), there is a significant lack of research in the area of information systems in this context. 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 leadership characteristics of ISD project leaders/managers within the context of virtual teams and traditional face-to-face teams.

Background and Literature Review

Traditional and Virtual Teams

Organizational teams can be defined as a collection of individuals who 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 & Bailey 1997).

Virtual teams on the other hand are groups of geographically dispersed coworkers that leverage various types of telecommunication and information technologies to accomplish organizational tasks (Townsend et al. 1997; Lipnack & Stamps 1999; Jarvenpaa & Leidner 1999; Saunders 2000). Virtual teams may rarely meet face-to-face, may be temporary and only exist to accomplish specific tasks, and may involve dynamic and revolving membership (Townsend et al. 1997).

Leadership

Definitions of leadership usually assume that it is a group phenomenon and 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 traits 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). In a more recent study by Kirkpatrick and Locke (1991), the traits pertaining to leadership have been 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 (extent to which the leader develops by mutual trust and focuses on subordinate’s well-being) and initiating structure (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 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). Five different types of power that may enable leadership are (drawn from French & Raven 1959): 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).

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.

Sample

The sample consisted of both traditional face-to-face (FTF) and virtual (VT) teams. Each of the traditional teams consisted of 4-5 students enrolled in a systems analysis and design course in a large US university, who were teamed up with 4-5 students enrolled in a database management course in the same university, resulting in eight teams. Virtual teams were comprised of 4-5 students enrolled in a systems analysis and design course in the same US university, who were teamed up with 4-5 students enrolled in a similar course in a Norwegian university, resulting in nine teams.

Design

The traditional teams were required to develop application systems to solve business problems for “real” organizations located in the home state of the US university. In the case of virtual teams, half of the teams (four) were required to develop application systems for organizations located in the home state of the US university, while the other virtual teams were required to develop application systems for organizations located in the home city of the Norwegian university.

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, document sharing, and threaded discussion.

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, and towards the end of the project (when the development of the information system was in full-swing).

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?” In similar fashion, 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.

Data Analysis (see Table 1 and Figure 1)

Prior to analyzing the data, researchers/authors 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 in a manner consistent with the open coding technique within the grounded theory tradition (Strauss & Corbin 1990). When discrepancies arose, a literature-driven analysis (searching the literature for supporting of ones’ position) was collectively performed, yielding complete agreement for all codeable items (Sarker et al. 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.

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, *Other Skills/Traits*, consisting of items like congeniality, practicality, humility, objectivity, and time management.

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.

Utilizing previous research by French and Raven (1960), *expert power*, which encompasses both technical and ISD project management knowledge, was identified as the sole construct within the power-influence perspective.¹

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 for 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.

Results

The results of the above-mentioned data analysis have been summarized in Tables 2a and 2b.

Face-to-Face and Virtual Teams

There were some differences noticed 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. 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 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 did show a slight difference 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 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.

¹The other types of power were not considered in this context, given the fact that the study involved the use of student teams where reward power and legitimate power would not be applicable.

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 US-FTF subjects identified a leader, 91% of US-VT subjects identified a leader, and only 47% of Norwegian subjects identified a leader.

Discussion

The differences identified in the data analysis section highlight the divergent characteristics identified by the different groups 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.

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 things are physically observed, placing less cognitive resources and salience on maintaining initiating and consideration activities.

The US-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 levels of concentration were given to the situation a leader was performing in, 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, whereas 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, in the form of top-down communication and expert guidance, to effectively overcome the lack of group proximity and reciprocity.

Within Virtual Project Teams - Comparing US and Norwegian Cultures

Within the Trait Perspective, a consistent differential 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 loaded

quite differently on two of the trait constructs, Leadership Motivation and Other Skills/Traits. The Leadership Motivation construct, consisting of personal and social power motives, had three times as many US-VT subjects, whereas twice as many Norwegian subjects identified with Other Skills/Traits construct consisting of congeniality, practicality, humility, objectivity, and time management. 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 & Lippitt 1960). These results can also be explained based on Hofstede's cultural variable of masculinity and femininity. Hofstede (2000) 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 is thought that as teams formed, normed, stormed, and performed, cultural differences in the forming and norming stages yielded the observed differences in how Norwegians valued initiation and consideration behaviors, but when it came time to the performing stage, initiation and consideration had acquired equal importance for the US-VT.

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 2000, 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, Norwegians needed or identified with a leader far less than their US counterparts. Hofstede (2000) argues that cultures that are low on "masculinity" viewed 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

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. Second, the FTF teams involved only students from the US. Ideally, comparisons between US/Norway virtual teams and US/Norway FTF teams would have been more appropriate. Finally, the premise underlying this study is that textual responses of team members represent their actual theories-in-use and not their espoused theories.

Conclusion

Kayworth and Leidner (2002), in their study of leadership in virtual and face-to-face teams, had 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 project leadership in virtual and FTF teams. What is required is a synthesis of the perspectives, based on which we propose the following key ingredients for effective virtual and FTF ISD project leaders.

The following ingredients for effective traditional and virtual ISD project leaders were derived from our data analysis, results, and discussion, and are put forth in rank order according to the leadership perspective frequency counts (Table 2a and 2b).

Ingredients for Effective Traditional ISD Project Leaders

- *Be a facilitator and motivator*
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.
- *Behavior management*
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.
- *Keep focused on the task at hand at all stages of the project*
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.
- *Change leadership style based on the need of the team*
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.
- *Be a performer in the ISD project towards the later stages, when "production" is in full swing*
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.

Five Key Ingredients for Effective Virtual ISD Project Leaders

- *Think team wise, but focus on each member*
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.
- *Continuous nurturing (task and social-related) of the team*
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.
- *Be practical and manage time efficiently*
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.
- *Match the context*
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.
- *Be an expert*
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.

References

- Bass, B.M. *Stogdill's Handbook of Leadership: A Survey of Theory in Research*. New York: Harper, 1981.
- Cartwright, D. and Zander, A. "Leadership and Group Performance: Introduction," In D. Cartwright and A. Zander (eds) *Group Dynamics*. Evanston, IL: Row, Peterson and Company, 1960.
- Cohen, S.G. and Bailey, D.E. "What makes Teams Work: Group Effectiveness Research from the Shop Floor to the Executive Suite," *Journal of Management*, (23), pp. 239-290, 1997.
- Fleishman, E.A. "Twenty Years of Consideration and Structure," In E.A. Fleishman and J.B. Hunt (eds.) *Current Developments in the Study of Leadership*. Carbondale, IL: Southern Illinois Press, 1973.
- French, J. R. P. and Raven, B. "The Bases of Social Power," In D. Cartwright and A. Zander (eds) *Group Dynamics*. Evanston, IL: Row, Peterson and Company, 1960.
- Hemphill, J.K. and Coons, A.E. "Development of the leader behavior description questionnaire." In R. M. Stogdill and A.E. Coons (eds.), *Leader behavior: Its description and measurement*. Columbus, Ohio: Bureau of Business Research, Ohio State University, 1957.

Hofstede, G. *Cultures Consequences: Comparing Values, behaviors, Institutions, and Organizations Across Nations*, Second Edition, Thousand Oaks: Sage Publications, 2001.

Horner, M. "Leadership Theory: past, present and future," *Team Performance Management*, Bradford, 1997.

Jarvenpaa, S. L., and Leidner, D. E. "Communication and Trust in Global Virtual Teams," *Organization Science*, (10:6), 1999, pp. 791-815.

Kayworth, T. R. and Leidner, D.E. "Leadership Effectiveness in Global Virtual Teams," *Journal of Management Information Systems*, (18:3), 2001-2002, pp. 7-40.

Kirkpatrick, S.A. and Locke, E.A. " leadership: Do traits matter?" *Academy of Management Executive*, (5:2), 1991, pp. 48-60.

Lipnack, J. and J. Stamps. "Virtual teams: The new way to work," *Strategy and Leadership*, (27:1), 1999, pp. 14-19.

Millikin, J. P. "The role of self-leadership in empowered wok teams," Unpublished Doctoral Dissertation, Arizona State University, Tempe, 1995.

Nygren, R., and Levine, E. L. "Leadership of work teams: Factors influencing team outcomes", Paper presented at the Third University of North Texas Symposium on Work Teams. Dallas, TX., 1995

Saunders, C.S. "Virtual Teams: Piecing Together the Puzzle." In R.W. Zmud (ed.), *Framing the Domain of IT Management: Projecting the Future Through the Past*, Cincinnati, OH: PinnFlex Education Resources, Inc, 2000, pp. 29-50.

Sarker, S., Lau, F., and Sahay, S. "Using an adapted grounded theory approach for inductive theory building about virtual team development," *DATABASE* (32: 1), 2001, pp. 38-56.

Strauss, A., and Corbin, J. *Basics of Qualitative Research*, Newbury Park, CA: Sage, 1990.

Townsend, A. M., DeMarie, S. M. and Hendrickson, A. R., "Are you ready for virtual teams?" *HR Magazine*, (41:9), 1997, pp. 122-126.

White, R. and Lippitt, R. "Leadership Behavior and Membership Reaction in Three 'Social Climates,'" In D. Cartwright and A. Zander (eds) *Group Dynamics*. Evanston, IL: Row, Peterson and Company, 1960.

Wilson, J. M., George, J., and Wellins, R. S. "Leadership trapeze: Strategies for leadership in team-based organizations." San Francisco, CA: Jossey-Bass, Inc., 1994

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

Table 1. Response Maps (Some Examples)

TRAIT APPROACH	SAMPLE COMMENTS
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
BEHAVIORAL APPROACH	
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
SITUATIONAL APPROACH	
Contextual Basis	Respond to Project Crisis, Knowledge of Client, Dedicated to the Project, Committed to the Project, Knowledge about the Project
POWER APPROACH	
Expert Power	Expertise, Knowledge about ISD, Technical Knowledge, Technical Expertise, Technical Background, Knowledge of the Business, and Competent

Note: * represents categories with extremely low loadings

Table 2a. Comparing Face-to-Face and Virtual Teams

	VIRTUAL US TEAM		FTF US TEAM	
	Time 1	Time 2	Time 1	Time 2
TRAIT APPROACH	40.86%	34.04%	41.18%	39.02%
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%
BEHAVIORAL APPROACH	34.41%	41.49%	42.35%	32.93%
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%
SITUATIONAL APPROACH	9.68%	9.57%	7.06%	13.41%
Contextual Basis	9.68%	9.57%	7.06%	13.41%
POWER APPROACH	15.05%	14.89%	9.41%	14.63%
Expert Power	15.05%	14.89%	9.41%	14.63%

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

Table 2b. Comparing Across Cultures Within Virtual Teams

	US		NORWAY	
	Time 1	Time 2	Time 1	Time 2
TRAIT APPROACH	40.86%	34.04%	32.26%	26.44%
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%
BEHAVIORAL APPROACH	34.41%	41.49%	41.94%	42.53%
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%
SITUATIONAL APPROACH	9.68%	9.57%	18.28%	18.39%
Contextual Basis	9.68%	9.57%	18.28%	18.39%
POWER APPROACH	15.05%	14.89%	7.53%	12.64%
Expert Power	15.05%	14.89%	7.53%	12.64%

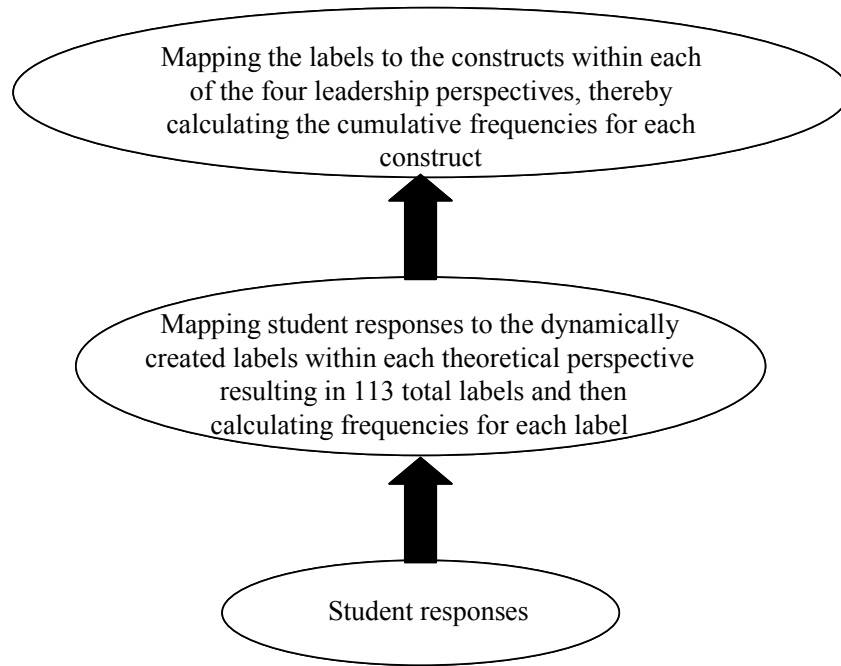


Figure 1. Data Analysis Process