

Chapter 5

Analysis and Findings

Introduction

The focus of this study was on leadership in virtual teams-teams of people who primarily interact electronically and who meet face-to-face infrequently or not at all. The Delphi technique and case study methods were used to determine if there were emerging patterns of leadership practices and information and communications technologies used in leading virtual teams.

This chapter contains three primary sections: the analysis of data collected from interviews and questionnaires and subsequent findings, conclusions, and recommendations.

Analysis and Findings from the Delphi Study

Responses to the thirteen interview questions were categorized or grouped by frequency or similarity of response and patterns of interest. This was done to reach a number that is manageable in order to create the second and third questionnaires. These responses were used to construct twenty-two aspect statements reflecting characteristics of leadership in virtual teams.

Question 1. What was the mission or purpose of the team and how was this mission or purpose created or shaped?

Team missions varied considerably. Some team missions were starting a new business, growing an existing business, developing a course, writing a book, and developing a software product. Mission statements were generally given to

the team; only a few teams were able to shape the mission. One respondent replied this way.

The team's purpose was to upgrade an existing software product to a new look and a better interface, including new features and to upgrade to Windows 95 compatibility.

Another respondent provided the following example illustrating a start-up business based from home.

This was a new business start-up consisting of three individuals working out of their homes. The object was to provide consultation.

There were no identifiable patterns. The interesting thing to this researcher was the variety of projects virtual teams were used to address.

This question was not explored further in subsequent rounds.

Question 2. What has happened so far on the project? When did it start? What phase are you in? What's next for the project?

This question was used to obtain information on the history or progress of the project and where it was headed. This question was not explored further in subsequent rounds.

Question 3. What is the structure or organization of the team?

With few exceptions, the teams studied were generally flat (low in hierarchy); organized in a wheel, all-channel, or combination structure; and interconnected electronically. The wheel and all-channel structure are further described as follows. The wheel is a structure where relatively independent team members primarily interact with just the team leader and the all-channel structure is one where relatively interdependent team members interact with

each other and the team leader. Wheel structured teams tend to be composed of relatively independent team members producing individual work-products and could be categorized as workgroups. All-channel or nearly all-channel structured teams tend to be composed of relatively interdependent team members and work-products may be either individual or collective. A typical combination is one in which sub-team leaders primarily interact with the team leader and sub-team members interact with everyone on their sub-team. The following three responses are illustrative of the flat structure of most of the teams.

[The XYZ publisher] and I were the editors, the rest of the 100+ team were authors of individual chapters.

Obviously, there is no hierarchical structure to the team. The project manager has no ruling authority over other members of the team. Her role is more of a coordinator charged with maintaining the team's focus.

The team consisted of 3 consultants in the Change Management practice. There was no team leader; instead, the team members worked together on deliverables and provide insights on their client experiences.

This question was not explored further in subsequent rounds.

Question 4. What was your role on this team (team leader, committee chair, team member)?

Respondents played a variety of roles on their teams such as editor, project manager, team leader, regional coordinator, representative, equal partner, and primary coordinator. There were no identifiable patterns.

This question was not explored further in subsequent rounds.

Question 5. Who did you primarily interact with (all team members, project leaders, etc.) and how? Did you have any previous interaction with these people before this project? How?

This question provides more information about the context of the teams particularly in regards to organizational structure. Responses to this question were combined with responses to question 3 in order to more completely identify the organizational structures. The following four responses illustrate the range and similarity of these interactions.

I interact with all fellow project development members (a project manager, two other instructional designers, two content experts, and a technology expert).

I interact with the leaders of the project, as well as the entire 100 affiliates that are members of this project.

All members.

My primary interactions were with the project manager. I had some direct interaction with the other functional representatives, but most of my dependencies were managed within the team.

This question was not explored further in subsequent rounds.

Question 6. Where were the team members physically located? Why were they not all collocated?

The virtual teams studied varied in their distribution. Some teams were distributed in a specific city, some were distributed throughout the United States, and some teams were distributed world wide. In some cases, only a few team members worked remotely from the remainder of the team. There were no iden-

tifiable patterns in terms of distribution. The following four responses illustrate the variety of distribution.

At final count, in 7 countries around the world.

The entire team was in Seattle except for myself and the development tester. We are in Minneapolis.

Members were located at their homes. We were not collocated since we did not want to incur the expense of offices and support.

Across the US: LA, Washington DC, Patuxent, MD, Connecticut, Orlando, UK, Germany, Netherlands. Co-location is not an option.

This question was not explored further in subsequent rounds.

Question 7. How were the team members selected and why?

There were no identifiable patterns of team selection. Some team members were selected because they were qualified, some were selected because they were available to work on the project, and some were invited to participate.

The following four responses illustrate the variety of selection methods.

Peer review of submitted chapter proposals.

For the pilots, the team members either volunteered or their names were given to our development team by representatives in their offices.

Team members were selected based on the needs to employ people to help run this organization.

The three partners selected each other to form the company. Associates were selected based on their experience and knowledge of groupware and collaboration skills.

This question was not explored further in subsequent rounds.

Question 8. What information and communication technologies (telephone, e-mail, conferencing, project management software, etc.) did the team use?

Electronic mail and the telephone were the two primary technologies used by the teams. FAX, Lotus Notes, and voice and video conferencing were used by a few teams.

This question was not explored further in subsequent rounds.

Question 9. Can you provide examples of when team members met face-to-face? Did sub-teams meet more frequently? Was face-to-face contact important? Why?

Seven aspect statements were created from the responses to this question for subsequent study. These statements were:

1. Face-to-face contact was not important.
2. Face-to-face meetings were important in creating ties and relationships.
3. Face-to-face contact was important in order to understand each other.
4. Face-to-face contact was important in order to address controversial issues.
5. Face-to-face contact was important to resolve conflict among team members.
6. Face-to-face contact was important for planning.
7. Face-to-face contact was important for problem solving.

The rating of the top four aspect statements on the importance of face-to-face contact at the end of questionnaire #2 ranged from a mean of 3.40 to 4.0 or less than complete agreement (rating of 4) of the importance. However, the

modal response was 4 or 5 or “strongly agree” with the importance of meeting face-to-face. There was a slight improvement in these ratings on questionnaire #3. However, in both questionnaires #2 and #3, the range of responses was from 1 to 5. Consensus was not evident.

The following two responses illustrate the importance of face-to-face contact.

Face-to-face is VERY important. You yell at the girl from Bell when your phone bill is messed up, not because she is responsible, but because you do not know her face. Once you have met, you have more compassion and understanding for your fellow team members.

Face-to-face contact is extremely important on this team. CMC (Computer Mediated Communications) is used primarily for non-controversial, detailed information that typically must be communicated to large numbers of people. Face-to-face meetings are needed to address controversial issues, resolve conflicts among team members or sub-teams, and to manage priorities and resources.

But there were other virtual teams where face-to-face contact was just not that important, for example, those teams with relatively independent team members producing individual work-products rather than collective work-products. Face-to-face contact also didn't seem important for a number of teams during the operational phase. The following two responses illustrate this notion.

Except for [co-team leader] and I meeting, there was only the occasional FTF at a conference which was not related to this project. So no, FTF was not important, except for [co-team leader] and myself.

We never met FTF during this project. I don't think it was necessary to have that contact in this instance. This was an upgrade of

an existing product, so everyone had fairly substantive knowledge and expectations of the product.

Table 4.1 presents the distribution of response data for questionnaires #2 and #3 and for the seven related aspect statements.

The following comments were received from the respondents regarding this question.

Aspect 1: Face-to-face contact was not important.

Questionnaire #2 comments:

Comment. Although the team can function on its own, it is much more difficult to have friction between people that you can put a face to. Teams that have never met risk the argument over progress or direction caused by the inability of a disembodied voice to command authority.

Comment. A virtual environment must compensate for the innate lack of personal, face-to-face contact. We are at essence still social creatures and we need to SEE our peers, teammates, and our boss frequently. My best estimate is that this lack of face-to-face contact should not exceed two weeks maximum. Better is once a week minimum contact for those working in a virtual environment.

Comment. Though it would have been nice to meet with people FTF, it wasn't necessary to the completion of the project. I think some of the review processes would have gone more smoothly if the persons involved had met FTF at one point or another.

Comment. Comments from participants in each of our 6 pilots indicate a desire for FTF interactions to be incorporated into the course.

Comment. I found that initial contact and minimal periodic contact was essential in maintaining a cohesive team.

Questionnaire #3 comments:

Comment. FTF meetings are very important and may be the biggest lacking in a virtual team.

Comment. I still believe that except in very special cases, those being where a member of the team can work wholly on his/her own, without any communications with the rest of the group, that FTF promotes an understanding and a comprehension that is needed for the project to succeed.

Aspect 2: Face-to-face meetings were important in creating ties and relationships.

Questionnaire #2 comments:

Comment. More so, they're critical to MAINTAINING and REENFORCING relationships.

Comment. Participants who did experience a FTF kickoff meeting for the "virtual" experience felt like they really bonded and interacted as teams.

Questionnaire #3 comments:

Comment. FTF meetings help bind the team together, partly because other, "non-job" issues can be talked about and people get to know each other better.

Comment. Cultural boundaries are more understood FTF.

Comment. It is hard to realize that they may be something in common with the individual one is working with (i.e., fishing, bowling) where FTF may give a visual clue or chance remark that would not have occurred otherwise. It is these bonds that sometimes increase a feeling of “membership” in a team.

Comment. Initial contacts were extremely important to the success of the teams to establish consensus goals and mission statement.

Aspect 3: Face-to-face contact was important in order to understand each other.

Questionnaire #2 comments:

Comment. Especially where ethnic differences or handicaps come to play. Often times, ones ethnicity will cause a reaction to certain comments or actions. Also, a handicap, or a physical attribute that is not necessarily evident in voice meetings may lead to unfortunate comments by members of the team. Once face-to-face contact has been established, certain respect filters in to the team.

Comment. I agree. We pickup and transmit most of our communications via visual signals and body movements and positions. These clues, and this input, is lost in a virtual setting. Video conference calls don't replace being there; for instance, you can't see what the people off-camera are saying and doing. Actions do speak louder than words, whether the words are written, spoken, or transmitted electronically.

Comment. We all communicate in non-verbal ways. Statements may be given more weight if body language or facial expressions support them.

Potentially, some miscommunication may have been avoided if FTF communication had been available.

Comment. All participants communicated quite effectively using groupware (Lotus Notes) and were able to understand one another without the FTF interactions.

Questionnaire #3 comments:

Comment. Building understanding builds trust, and trust is what builds teams and binds it together.

Comment. I'll stay with "strongly agree" on this question for two primary reasons: (1) because of the absence of non-verbal cues in virtual interactions (cues that my experience has shown are fundamental to our ability to truly "understand each other"), and (2) because of the unavoidable fact that some people have limited writing skills, and are thus less able than others to convey their true feelings in a text-based medium.

Aspect 4: Face-to-face contact was important to address controversial issues.

Questionnaire #2 comments:

Comment. For several reasons, many mentioned above. In-person, time becomes less of a consideration, and sufficient time is sometimes all that's needed to resolve misunderstandings. Virtual contacts can create artificial time constraints, either because people sometimes become aware of excessive com-

puter or network time during resolution and seek to terminate the session, or because people's productivity begins to fall-off when they hang on the line too long. It's hard to stay focused when you're at the end of the food chain.

Comment. I can think of one occasion where disagreement occurred that was more effective because of the lack of FTF. Emotional response can be minimized in non-FTF communication.

Comment. There were no controversial issues.

Comment. All of these can be done at a distance. There are occasions; however, that it is BENEFICIAL to have FTF contact (i.e., contract negotiations, celebrations/recognition after controversial sessions or closure).

Comment. On occasion, this was important. However, my guess is that it was less than 30% of the time.

Questionnaire #3 comments:

Comment. Controversial issues require more time and more input to resolve. Most of what we communicate is transmitted and received via non-verbal (and therefore non-written) clues. These clues and this communication can only be effective in a FTF setting.

Comment. The bandwidth did not allow the emotion of the moment to be expressed. Some may feel that emotion should not be there, but it sometimes is one's ability to express emotion that can convey a sense of urgency or lightness to an issue that others are misreading.

Aspect 5: Face-to-face contact was important to resolve conflict among team members.

Questionnaire #2 comments:

Comment. The few minor conflicts that did arise were managed via groupware or the telephone and were handled effectively. FTF was not an option.

Comment. Again, can be done at a distance.

Comment. On occasion, this was important. However, my guess is that it was less than 30% of the time.

Questionnaire #3 comments:

Comment. Comments were the same as for aspects 3 and 4.

Aspect 6: Face-to-face contact was important for planning.

Questionnaire #2 comments:

Comment. Once the team is established, planning can be done via other methods. FTF may help in some circumstances, however, there is a tendency to want the entire team present, and they cause too many open lines of communication for it to be conducive to quick planning, which is what you want in a one or two day meeting.

Comment. Agree, but less strongly than for establishing and maintaining relationships or for resolving misunderstandings.

Comment. I think FTF in the planning stage would have smoothed some future misconceptions and communications.

Comment. With regards to planning for the faculty before each pilot session, they requested one on one sessions with the coordinator to understand their responsibilities and the software. FTF put them more at ease and allowed their questions/concerns to be addressed immediately. There was no FTF planning on the part of the participants.

Comment. The review of planning documents suffers because we do not gather people around a table. Instead we tend to send out electronic copies of the planning documents, which few people read. Planning itself, however, seems to take on a life of its own after an initial FTF kick-off meeting.

Comment. Initial contact for planning purposes was crucial.

Questionnaire #3 comments:

Comment. A lot of planning stuff can be administered via e-mail and the written word, it's less "verbal-intensive" than people issues like personal conflicts. I'm neutral on this question.

Comment. If the team is professional and knows where they are headed, the planning stage can be done without meeting FTF. Only confirmation meetings may be needed, or nothing at all.

Comment. I still think this is crucial. The complexity of the project along with the naiveté of the users with respect to the virtual environment made this very important. Finally, the element of trust that must be established with suppliers and team members is most easily gained in an initial FTF meeting.

Aspect 7: Face-to-face contact was important for problem solving.

Questionnaire #2 comments:

Comment. It may help to have had face-to-face in the past, however, for any particular problem, it is not necessary during the problem solving phase.

Comment. Remote problem solving takes a longer time and has more errors than FTF problem solving, no doubt related to miscommunication.

Comment. FTF was not needed for problem-solving. Most problems were solved by discussions in groupware. Most technical problems were solved by communications over the phone.

Comment. Free information flow and self-directed team members get problems solved very well.

Comment. For most problems, FTF was not necessary.

Questionnaire #3 comments:

Comment. Problem-solving, to me, requires more “content-rich” communications and therefore more FTF contact. I think it’s important and more efficient to resolve problems FTF. Also, final agreement on the solution can be sealed with a handshake and a look into the other person’s face—very important human commitment steps. These are not possible electronically.

Comment. My experience has shown that problem solving is one of the best examples of the utility of virtual interaction. Because participants can view the problem critically, without the interruptions common in FTF meetings, and take time to consider possible options carefully before posing them, the solu-

tions arrived at with the help of virtual interaction are generally better than those arrived at in FTF meetings.

Comment. The skill is doable alone, but team attacks on a problem are often more fruitful. It is easier to spend 6 hours in a room with someone else than 6 hours on a phone with them.

Summary of Question 9 and Question 9 Aspect Statement Responses

Face-to-face contact was generally considered important in most teams, especially in the formative stages, but less important in the operational phase.

Factors found important for team members in meeting face-to-face include: creating ties and relationships with other team members, reducing potential conflicts among team members, building a cohesive team, achieving consensus on team issues, improving the effectiveness of communications (social cues are evident), and for rewards and recognition.

Two factors were found in which face-to-face contact was considered less important. These two factors were: (1) the team members were relatively independent and produced individual work products, and (2) the team members knew each other and for this project, they agreed it was not necessary to meet.

Question 9. Can you provide examples of when team members met face-to-face? Did sub-teams meet more frequently? Was face-to-face contact important? Why?

There were 12 responses to this question in questionnaire #2. There were 9 responses to this question in questionnaire #3.

Table 4.1

Distribution of Response Data to Aspect Statements of Question 9

Aspect Statement	Mn Q2	Mn Q3	Md Q2	Md Q3	Rg Q2	Rg Q3
2. FTF meetings were important in creating ties and relationships	4.0	4.0	4,5	5	1-5	1-5
3. FTF contact was important in order to understand each other.	3.5	3.67	4	3,5	1-5	1-5
5. FTF contact was important to resolve conflict among team members.	3.5	3.56	4	3,4	1-5	1-5
4. FTF contact was important to address controversial issues.	3.42	4.0	4	4	1-5	1-5
6. FTF contact was important for planning.	3.25	3.0	3	3	1-5	1-5
1. FTF contact was not important.	2.83	2.44	2	2	1-5	1-5
7. FTF contact was important for problem solving.	2.75	2.89	2,3	4	1-4	1-4

Note: Mn refers to mean, Md refers to mode, and Rg refers to range.

Question 10. Can you provide examples of where individual or team accomplishments were celebrated? If not, would there have been any if the team had been collocated?

Four aspect statements were created from the responses to this question for subsequent study. These statements were:

8. There were no team celebrations of accomplishments.
9. Team members were given positive feedback, praise, or recognition on-line.
10. Accomplishments were celebrated FTF at the end of the project.
11. Accomplishments were celebrated during intermediate FTF meetings.

The rating of these aspect statements on the importance of celebration and recognition at the end of questionnaire #2 ranged from a mean of 2.3 to 3.4

or from a “do not agree” to just above a neutral rating. The highest rated aspect statement was on recognizing team members on-line. This is perhaps not too surprising due to the difficulty and expense in bringing distributed team members together. There was very little change in the responses from questionnaire #3. The range of responses in both questionnaires #2 and #3 were almost identical except for one aspect statement. The responses ranged from 1 to 5 for some aspects and 1-4 for others, indicating there was no real consensus.

The following four responses illustrate the notion of individual and team celebrations.

We celebrated our accomplishments as a matter of course in our daily online communications.

Team accomplishments are celebrated in two ways: Through e-mail acknowledgments from executive management, and through FTF celebrations.

No. This team is for the purpose of sharing information and coordinating the development of that information (within the constraints of company budgets and priorities).

Participants don't technically “celebrate” accomplishments, but rather receive positive feedback, words of praise, etc. for a job well done.

Table 4.2 presents the distribution of response data for questionnaire #2 and for the four related aspect statements.

The following comments were received from the respondents regarding this question.

Aspect 8: There were no team celebrations of accomplishments.

Questionnaire #2 comments:

Comment. They occurred by happenstance. Should we find ourselves in the same town at the same time, we would meet and celebrate past performance.

Comment. It's hard to answer this question with a 1 - 5 rating. I strongly agree there should be team celebrations of accomplishments, however, the reality for me was that virtual team members weren't always able to attend these celebrations.

Comment. Remote team members do not share in celebratory events.

Comment. There were no celebrations of any sort – sounds drab, doesn't it?

Comment. Our culture is one of publicly recognizing the accomplishments of others. Since the team has a high commitment to "getting the job done," taking time out to travel across the country for a backslapping session would be seen as a waste of time. We do manage to gather socially during the course of our work, and that feels more sincere than the big bash for the entire group.

Comment. There should always be some celebration for accomplishments—conducted according to level of achievement.

Comment. There were occasional celebrations.

Questionnaire #3 comments:

Comment. My experience was that there were team recognitions but that they heavily reflected the central location where most of the team was located. Things like team picnics. It was not practical or reasonable to fly the four or five

“remote” team members there just for a picnic, but it did give us a feeling of being left out. . . . Likewise, rewards and recognition tended to be given nearer the headquarters. I was given the impression we at the end of the food chain should just be thankful we had a job.

Comment. Varied widely based on team, project time frame, and location of members.

Comment. Team celebrations done well, contribute to morale and to team members sense of worth in their job. As a team leader, I occasionally try to engineer a team celebration by getting us all in the same place at the same time. But shipping people across country for a large impersonal gathering with a lot of people they don't know would feel (to us all, I think) like a waste of time and money. These are highly motivated non-employee people and they would rather their efforts be rewarded with new opportunities than with junkets.

Aspect 9: Team members were given positive feedback, praise, or recognition on-line.

Questionnaire #2 comments:

Comment. A requirement for effective work.

Comment. This didn't occur and I'm glad, for the following reasons.

(1) This type of feedback should best be accomplished by the boss in front of the team, and (2) electronic feedback just doesn't seem right when it comes to personal communications, whether positive or negative. There's something in our culture about shaking someone's hand when you're thanking them. This can't be

replaced. In addition, in larger organizations, Human Resources people might have rules specifying how, where, and when certain awards must be presented.

Comment. Most communication of a personal nature such as “Job Well Done” was via telephone or voice mail, not by e-mail.

Comment. Participants were given general feedback; some of the coach’s comments were positive, but most were simply thought provoking.

Questionnaire #3 comments:

Comment. I strongly disagree. The quality and quantity of on-line recognition was not the same for people working “more” in a virtual team environment. Maybe this is the basic problem I encountered, that is, our team was always a mix of “regular” team members at a central location and about one-third of us scattered around the country in a mostly virtual setting.

Comment. The difference here is simply attributable to my experience. In the virtual teams I’ve worked in, the on-line medium was commonly used as a vehicle for bestowing praise in a very public way.

Comment. We like keeping our team members. They do good, someone has to be told.

Comment. It is hard to really express or receive a feeling of praise without the response of a peer group at the moment.

Aspect 10: Accomplishments were celebrated FTF at the end of the project.

Questionnaire #2 comments:

Comment. No closing celebration was held, that I'm aware of, for the projects I worked on in a virtual setting. Projects kind of oozed into each other without formal openings or closures. In my case, I didn't see anyone from the team for the last 12 months I worked in that environment.

Comment. Accomplishments were not 'celebrated' at all.

Comment. Well, our customer keeps promising.

Comment. Projects can be big or small; flying people all over the country for a "small" matter of course project is expensive and time consuming; however, there are many ways to celebrate.

Comment. Time frames and the type of project along with other issues prevented this.

Questionnaire #3 comments:

Comment. Our team just seemed to evolve from one project to another with little firm beginnings and endings on specific projects. Rewards and summaries therefore were far and few between for us in the hinterlands.

Comment. Again, this is simply what my experience has been. In the teams I've worked in, praise was bestowed and accomplishments were celebrated on-line first and FTF later. The on-line medium was used to make celebrations timely.

Comment. One-to-one, we celebrate accomplishments FTF whenever we can.

Comment. There is a need for closure that can not be accomplished remotely. In some cases, there may be needs for “good byes” or final expressions of success or frustration with other team members.

Aspect 11: Accomplishments were celebrated during intermediate meetings.

Questionnaire #2 comments:

Comment. Celebrations were held, but not for accomplishment, they were drinks to the future. All too often, once the goal of the team was complete, they would hardly ever meet again.

Comment. See comment 2 under aspect 3. Occasional conference calls did recognize service anniversary dates and such things, not quite the same as a team celebration upon the achievement of intermediate team goals.

Comment. We try to acknowledge accomplishments at all meetings, but do not have a “celebration” agenda item for this purpose.

Comment. Rarely.

Questionnaire #3 comments:

Comment. Originally this would happen more often, but as time went on, we found this often made people feel like something was accomplished and that they could lay back a little. We did give bonuses, or send people out for a night/weekend with the significant other, or what ever, but too many parties tended to take focus away from the main goal.

Comment. Just didn't have time to make this happen on a regular basis. Too bad though because it is important.

Summary of Question 10 and Question 10 Aspect Statement Responses

In general, team celebrations were not used for a variety of reasons: (1) the team members were relatively independent and the team was in reality more of a workgroup, and (2) the time and cost required to bring team members together. Several respondents remarked about the cost or expense associated with bringing people together as one reason for not rewarding or celebrating the accomplishments of the project. Recognition of individual and team accomplishments was generally given on-line via e-mail or telephone – it conveyed the message at a very low cost.

Question 10. Can you provide examples of when team members met face-to-face? Did sub-teams meet more frequently? Was face-to-face contact important? Why?

There were 12 responses to this question in questionnaire #2. There were 9 responses to this question in questionnaire #3.

Table 4.2

Distribution of Response Data to Aspect Statements of Question 10

Aspect Statement	Mn Q2	Mn Q3	Md Q2	Md Q3	Rg Q2	Rg Q3
9. Team members were given positive feedback, praise, or recognition on-line.	3.5	3.67	4	4,5	1-5	1-5
11. Accomplishments were celebrated during intermediate FTF meetings.	2.75	3.22	4	4	1-4	1-4
8. There were no team celebrations of accomplishments.	2.42	2.33	1	1	1-5	1-4

10. Accomplishments were celebrated FTF at the end of the project.	2.33	2.56	1	1	1-5	1-5
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Note: Mn refers to mean, Md refers to mode, and Rg refers to range.

Question 11. Can you provide any examples of team members being challenged, encouraged, rewarded, participating in key decisions, coached, or listened to? How was their morale?

Three aspect statements were created from the responses to this question for subsequent study. These statements were:

12. Team members were continually challenged and encouraged to perform.
13. Team members were challenged by project activities or performance targets.
14. Rewards were primarily intrinsic, e.g., knowledge gained could be applied to future projects.

The rating of these aspect statements on the challenges, encouragement's, and rewards at the end of questionnaire #2 ranged from a mean 3.8 to 4.1 or from a slightly less than agreement to agreement. The highest rated aspect statement was that team members were challenged by project activities or performance targets. There was some overall improvement in both the mean and the range in questionnaire #3. There was general consensus on aspect statements (13) team members were challenged by project activities or performance targets and (12) team members were continually challenged and encouraged to perform.

The following three examples illustrate the range of responses.

Challenged, encouraged, and coached are at the very nature of the editing and authoring process.

Teams are being challenged by activities that force them to conduct in-depth analyses of their change projects and then create deliverables which, in many cases, they will present to their manager or project team.... The rewards stem from the application of the concepts they learn on their own client case combined with assessments that they can use back on the engagements.

Each team member, partners, and associates, were responsible for the assignments and highly encouraged to interact with other members to identify problems, work tasks, reward efforts by others.

Table 4.3 presents the distribution of response data for questionnaire #2 and for the three related aspect statements.

The following comments were received from the respondents regarding this question.

Questionnaire #2 comments:

Aspect 12: Team members were continually challenged and encouraged to perform.

Questionnaire #2 comments:

Comment. As much as possible, however all teams I have formed part of have also tried to share the load as much as possible, trying to keep everyone involved even when they were not really needed.

Comment. I agree, but in my case the encouragement was generally in a negative vein.

Comment. I don't know if this is a function of remote teams, or a function of corporate climate and producer style. (The producer being the person who "drives" the project.)

Comment. Most participants felt that the activities they performed were challenging and they were encouraged to analyze further through thought-provoking questions from teammates and the coach. Participants also felt accountable for their assignments since many involved analyzing their teammates' deliverables and providing feedback.

Questionnaire #3 comments:

Comment. This is an issue of leadership and can be done effectively in a virtual environment.

Aspect 13: Team members were challenged by project activities or performance targets.

Questionnaire #2 comments:

Comment. The goals were very challenging.

Comment. Participants felt like they were challenged by the activity goals and tasks that were assigned to them throughout the course.

Comment. I think that project activities have been more important than targets, Most of our team consists of contractors, for whom the project is itself a customer. As a result, they tend to be highly motivated.

Questionnaire #3 comments:

Comment. Some team members found some activities unchallenging—“not rocket science,” or “for this I went to college.”

Aspect 14: Rewards were primarily intrinsic, e.g., knowledge gained could be applied to future projects.

Questionnaire #2 comments:

Comment. In the case of working teams, such as s/w development true. However in the case of User group conference organizations, there tended to be many perks, such as all expense paid trips to the conferences, dinners, and receptions, special team nights out . . . a few extra days in a different city with nothing to do but explore for the sake of it. Work teams get a salary. Volunteer teams get perks.

Comment. I would tend to disagree. As I answered during Round 1, our virtual group came into being partially to accommodate corporate downsizings and staff imbalances. The only intrinsic reward we received was the possibility of staying employed and to find another position within the company prior to our projects winding down. Again, little pre-planning went into our virtual team’s set-up, it just happened.

Comment. There were no extrinsic incentives. Team members may have been personally motivated and self-challenging.

Comment. The knowledge gained from analyses (during the activities) was directly applicable to their current engagements.

Comment. That and the having of a job for another year.

Comment. It was anticipated by some team members that other rewards would be forthcoming.

Questionnaire #3 comments:

Comment. I'm neutral on this question. I guess upon reflection that I did take good experiences away from this experience, although my career wasn't necessarily helped by it.

Comment. Sometimes, but a pat on the back, and dinner and dancing or a ski weekend for someone who did exceptionally well was never that uncommon.

Summary of Question 11 and Question 11 Aspect Statement Responses

In general, respondents agreed with the importance of challenging, rewarding, and encouraging team members. Rewards tended to be more intrinsic, perhaps due to the nature of the virtual environment. Challenges tended to be in the nature of the work, not team leaders challenging team members to improve or work better and smarter. The rating for this aspect increased slightly from questionnaire #2 to #3. This could be a reflection of the interpretation of the statement however, and people responding from their perspective. Some respondents indicated that encouragement was negative. Overall, however, teams were clearly challenged by the projects they worked on.

Question 11. Can you provide any examples of team members being challenged, encouraged, rewarded, participating in key decisions, coached, or listened to? How was their morale?

There were 12 responses to this question in questionnaire #2. There were 9 responses to this question in questionnaire #3.

Question 12. Have you learned anything interesting about being on a virtual team? What would you have done differently if the team had been collocated?

Table 4.3

Distribution of Response Data to Aspect Statements of Question 11

Aspect Statement	Mn Q2	Mn Q3	Md Q2	Md Q3	Rg Q2	Rg Q3
13. Team members were challenged by project activities or performance targets.	4.17	4.4	4	4	1-5	4-5
12. Team members were continually challenged and encouraged to perform.	4.00	4.33	4	5	1-5	4-5
14. Rewards were primarily intrinsic, e.g., knowledge gained could be applied to future projects.	3.75	3.56	3,4	3	2-5	3-5

Note: Mn refers to mean, Md refers to mode, and Rg refers to range.

Four aspect statements were created from the responses to this question for subsequent study. These statements were:

15. The virtual environment enabled the ease and convenience of communications among team members.

16. It was important to keep everyone informed of things taking place.

17. It was often difficult to get people to complete action items and tasks.

18. Consensus decision-making increased team commitment.

The rating of these aspect statements on interesting things learned about being on a virtual team at the end of questionnaire #2 ranged from a mean of 3.00 to 4.0 or from a neutral position to agreement. The highest rated aspect statement (16) was that it was important to keep everyone informed of things taking place. Responses on questionnaire #3 indicated a positive shift in the mean values of three of four aspect statements considered in this section. These responses were high enough to indicate general consensus. These aspect statements are (15) the virtual environment enabled the ease and convenience of communications among team members; (16) it was important to keep everyone informed on things taking place; and (18) consensus decision-making increased team commitment.

The following three responses with respect to learning something interesting about being on a virtual team are illustrative.

But overwhelmingly, authors found this process useful because of the ease and convenience in communication between themselves and the editors especially, and also among other authors. Authors commented that regular updates from us [team leaders] were important in giving them a sense of “ownership” or “community” in this effort compared with other edited works to which they had contributed.

It’s always important to be courteous and tactful to other team members. Whenever possible try and keep everyone informed of things that are taking place. When teams work well together, the results can be very exhilarating.

Yes, virtual teams seem to suffer more political tension than collocated teams. Differences are covered and tend to explode instead of being brought to the surface when needed. The bandwidth provided by technology is not sufficient to address these issues.

Location does not make or break success. Communication of many different kinds can produce effective results without co-location.

Table 4.4 presents the distribution of response data for questionnaire #2 and for the four related aspect statements.

The following comments were received from the respondents regarding this question.

Aspect 15: The virtual environment enabled the ease and convenience of communications among team members.

Questionnaire #2 comments:

Comment. Our teams made heavy use of e-mail.

Comment. I have to respond yes and no to this question. At times it made communications easier, at other times I think it made things worse. The personal feedback item was hampered by this environment, while the transfer of data was increased by the use of things like voice and e-mail.

Comment. Because of the geographic and time zone differences, there was only a three hour window in which timely communication could occur. Otherwise a team member would wait at least a day for a response to a question or other concern.

Comment. It enabled the convenience of communications in that the participants did not have to leave their client engagements to come to a central location to network. However, the communications were not as rich and not as

“easy” because of the fear of misinterpretation of written words (most communications was text).

Comment. We use e-mail, phone, fax, and pagers. We make little use of the Internet and videoconferencing. We have one project member who does not yet have a PC; I have noticed much more time and fax paper being spent in keeping him in the loop.

Questionnaire #3 comments:

Comment. Overall, I think my team was working around the limitations to communications presented by the virtual setting. A “normal” team environment would have experienced improved and better communications in my opinion.

Comment. Getting easier day by day!

Comment. If an entire virtual environment had been established, I would agree. In my case, communication was sneakerlan at times when electronic communication would have worked perfectly.

Comment. It all depends on an individual’s ability to adapt to the virtual environment metaphor. If one can’t, then there is no ease and convenience of communications to that individual.

Aspect 16: It was important to keep everyone informed of things taking place.

Questionnaire #2 comments:

Comment. To a certain extent. No more so than if they were in the same office. We informed of completed tasks, and big picture responsibilities, but not too detailed. Caused too many problems.

Comment. I strongly agree it was important but this didn't always happen. For instance, a meeting might take place at the headquarters location, changes would be made, actions initiated, yet no one remembered to send copies of the changes or the discussions to virtual team members. Some of this oversight can be attributed to our very dynamic team situation and the customers we were supporting.

Comment. Not all team members need to know what the other team members are doing. (I don't know if this comment is appropriate here, but I think the importance of a design document is greatly increased in virtual environments).

Comment. Yes, in a virtual environment, participants can easily become lost if they feel they are not receiving communications or being informed of the happenings. Frequent communication is critical.

Comment. As team leader, I spend a lot of time as a central point of information distribution: from the team to management, customer, etc., and from these places to the team.

Questionnaire #3 comments:

Comment. I strongly agree with this statement, partly because this wasn't my experience on my team. I do think it's important to keep everyone informed, it just didn't happen often enough for me.

Comment. Yes, but don't let them get bogged down in details that do not concern them. They have a job to do.

Comment. Not of ALL things. There are strata of information that apply to various organizational groupings in a virtual team.

Aspect 17: It was often difficult to get people to complete action items and tasks.

Questionnaire #2 comments:

Comment. Volunteer teams this was sometimes true. Work teams, much less so.

Comment. I strongly agree. Much of project management in my experience consists of personal meetings with process owners, to clarify what actions were taken and to discuss (real time) whether the action item could be closed; seldom are there black and white closure points. A virtual environment made these personal discussions and closure points more difficult.

Comment. I always feel that my questions and concerns are of a top priority, therefore any delay in addressing them causes difficulty. Sometimes I had to proceed on the faith that what was said will be, will in fact be.

Comment. One benefit of our course was that it is mandatory for the participants. They need to take the course to be promoted to manager, the next level on their career path. The only issue that has arisen is potential conflicts with concurrent client responsibilities, which has forced some participants to drop out of the course completely (to take it a later date).

Comment. Our team consists of very self-directed individuals. I don't know whether we're just lucky, whether we have the right people, or whether the environment has created the "right" behavior in the individuals.

Comment. Agree would also be my answer in a FTF location. Virtual teams do not have a major disadvantage to task completion.

Comment. With respect to outside suppliers that were involved, it became a problem which I am not sure FTF would have helped greatly. Intra-team this was not a problem anymore so than a normal team environment because the team leader knew each team member well.

Questionnaire #3 comments:

Comment. As a former project manager I found it important to sit down with people to determine where they were on any specific action item. Answers were rarely black or white, and much discussion was required to determine the actual status of an action item. I don't think much of this discussion and dialogue could have occurred in a virtual setting; at least it wouldn't have occurred as efficiently.

Comment. The only thing I would say to this is that this was my experience in the virtual teams I worked in, and that it wasn't in any way attributable to the fact that the team has a virtual dimension to it. I think this has been true in most team situations I've worked in.

Comment. Still a 2 [disagree], but this was more due to the dedicated individuals involved.

Comment. Some people lend themselves well to this environment, others not so well.

Aspect 18: Consensus decision-making increased team commitment.

Questionnaire #2 comments:

Comment. With the trade off of slowing down the process.

Comment. I don't know how to rate this item based on my experience.

I'm not sure if we ever had consensus team building and decision making.

Comment. The producer on this job was god, there was no consensus decision making.

Comment. There was no consensus decision making. (Our definition of a team was different from the typical definition).

Comment. We use consensus for certain types of decisions, such as who will do what.

Comment. Consensus generates more responsibility and buy-in.

Questionnaire #3 comments:

Comment. I believe real team commitment comes at the personal level and that authentic communications is required. FTF settings are the best for this activity. The loss of non-verbal clues and communications is probably significant here. I believe stronger consensus-building and team commitment result from FTF experiences, and that virtual teams suffer when compared to them.

Comment. Consensus decision-making increased team commitment.

Comment. It also made the losers of a vote feel even more adamant. If the word of God was handed down from above (like the CEO) then no one won, they just do as told.

Summary of Question 12 and Question 12 Aspect Statement Responses

In many respects, the aspects covered here apply equally to virtual teams and collocated teams. Respondents generally agreed that it is important to keep people informed, the virtual environment enabled the ease and convenience of communications, and that consensus decision-making increased team commitment. Respondents also indicated professional team members accomplished their tasks in a virtual environment. Perhaps surprisingly is that the virtual environment enabled the ease and convenience of communications of team members. An interesting research question would be: Is it easier to communicate with people face-to-face or is it easier to do so electronically, and if so, why?

Question 12. Have you learned anything interesting about being on a virtual team? What would you have done differently if the team had been collocated?

There were 12 responses to this question in questionnaire #2. There were 9 responses to this question in questionnaire #3.

Question 13. What were some of the major problems or challenges attributable to working in a virtual environment (e.g., trust, collaboration, leadership, communicating, decision-making, team or individual focus)?

Table 4.4

Distribution of Response Data to Aspect Statements of Question 12

Aspect Statement	Mn Q2	Mn Q3	Md Q2	Md Q3	Rg Q2	Rg Q3
16. It was important to keep everyone informed of things taking place.	4.17	4.56	5	5	2-5	3-5
15. The virtual environment enabled the ease and convenience of communications among team members.	3.92	4.33	5	5	1-5	2-5
18. Consensus decision-making increased team commitment.	3.50	4.11	5	5	1-5	3-5
17. It was often difficult to get people to complete action items and tasks.	3.08	3.11	3	3	1-5	1-5

Note: Mn refers to mean, Md refers to mode, and Rg refers to range.

Four aspect statements were created from the responses to this question for subsequent study. These statements were:

19. Time delays in responding to e-mail messages or telephone calls were a common or frequent common problem.
20. It was often difficult to reach people because there was no visibility of when people were out of the office due to meetings, travel, vacation, or illness.
21. Current technology is insufficient to carry the right messages, (e.g., real-time human and social cues).
22. There was a perception that some team members were not really working (out of sight, out of mind).

The rating of these aspect statements on major problems or issues at the end of questionnaire #2 ranged from a mean of 2.50 to 3.50 or from a slightly disagree to slightly agree. Just looking at the mean value it would seem that

these four aspects are not really a problem. The modes of these aspect statements gives a different picture. The responses from questionnaire #3 don't indicate any real change. In general the responses vary around neutral on the aspect, but with a wide range.

The following four examples illustrate the variety of responses.

I do think that virtual team members weren't "trusted" enough, that somehow the feeling was that they were "getting away" with something, or that they weren't working as hard. I know we lost valuable visibility, with our boss, their boss, the organization, and within the company—all of these were career effecting. Communication is critical in a virtual environment, processes must be built which make up for the loss of normal communications. Concerning decision-making, my experience is that I was less a part of the decision-making process, whether through time and distance issues, or because of a lack of trust issues—I'll never know for sure.

Two of the major challenges include: scheduling of participants' time and effectively communicating in a virtual setting.

The only one from my perspective that is constantly frustrating is "non-responsiveness." It is easier to just ignore e-mail than when I as project manager would be "in a person's face."

Communication in a virtual environment has its own set of challenges. It is sometimes difficult to derive the meaning from text-based messages, especially if the person is attempting to be sarcastic or facetious at times. Guidelines on how to let others know the intention of your message (whether it's through the use of emoticons or whatnot) are important.

Table 4.5 presents the distribution of response data for questionnaire #2 and for the four related aspect statements.

The following comments were received from the respondents regarding this question.

Aspect 19: Time delays in responding to e-mail messages or telephone calls were a common or frequent communications problem.

Questionnaire #2 comments:

Comment. Occasionally, however it was part of the culture of the team members to place a strong importance on these facets of communications.

Comment. To get around this problem, if a really big issue had to be resolved, people were flown back to the headquarters or other locations to work on the solution in-person as a “real” team. In other words, the virtual team concept was abandoned when high priority activity had to be completed.

Comment. The delay in communications caused for a sense of abandonment to come over some of the participants. They felt like they were all alone out there. As a result, we have shortened the length of some of our pilots so participants communicate more frequently over a shorter period of time.

Comment. The team is very good at this. My management and administration staff, who live in a non-virtual environment, are not as good. My immediate boss (coach), however, is getting better. I still often have to use many messages in many media to get her attention.

Comment. This is dependent upon individuals not the method or location.

Questionnaire #3 comments:

Comment. One has no control over when the other party will respond to an e-mail.

Comment. Not the end of the world, but yes, a problem.

Comment. Some individuals use these media better than others.

Comment. This was just not a major problem. I wonder how many of the other respondents of this questionnaire were involved in working with outside suppliers whose paychecks were represented by making these connections when necessary.

Comment. This is true even if the person is one office away and the caller feels a sense of urgency about the message that needs attention.

Aspect 20: It was often difficult to reach people because there was no visibility of when people were out of the office due to meetings, travel, vacation, or illness.

Questionnaire #2 comments:

Comment. Although this was true in some cases, for the most part there was slack time provided for this issue. When things were tight time-wise, most people devoted time directly to the projects, and sat near the phone. Should they be required to be absent, they generally left other methods of being reached (cell phone, pager, etc.).

Comment. I'm neutral, and may be disagreeing with this statement. We knew how to reach people, and did, if it really mattered. Another level of decision-making was required however. For instance, do I really want to call (X) out of a meeting or on vacation, to discuss what I feel is more important?

Comment. Any time one of the team members was scheduled to be absent, prior notice was given to the rest of the team. On one occasion, the project

director was out for several days with a sick child, the rest of the team accommodated his absence.

Comment. It wasn't difficult to reach the participants, except for the few who ended up dropping out.

Comment. We do not have a calendaring system, but keep track of movements by virtue of frequent "where are you today?" exchanges during teleconferences.

Comment. Meetings/calls were scheduled; many people wear pagers and/or were accessible by cellular phone. Voice mail is checked frequently by team members.

Questionnaire #3 comments:

Comment. There were ways to reach people, since most had backups or covered for themselves while they were gone.

Comment. I'm neutral on this one because I have found that, with some widely-distributed teams, vacation, travel, etc., can be a problem. It certainly is not a problem with localized virtual teams because vacations and travel can be communicated to the entire organization through the use of e-mail bases "aliases" or mailing lists.

Comment. It made it harder to know when someone was not there ahead of time, but it also made it simpler to deal with those that are normally hard to get a hold of, as the virtual environment is made to deal with just those issues.

Comment. We have a small group, and keep track of each others' movements.

Comment. I guess the response to this one is dependent on the technology used by the group. We did not have calendar functions so we could not have visibility of an individual's movements.

Aspect 21: Current technology bandwidth is insufficient to carry the right messages (e.g., real-time human and social cues).

Questionnaire #2 comments:

Comment. Bandwidth is a TOOL, not a total solution. There are other tools being put into place for social cues etc. (e.g., smilies, ...). The phone is also VERY important in conveying a large part of that message.

Comment. I strongly agree. See responses to aspect statements 1,2, and 3. I'm not sure if the issue is "technology bandwidth" however. To me, the issue centers more on human social needs and the way we communicate as a species than it does on technology.

Comment. Hmmmm, tough statement, is this the responsibility of technology? Don't we need to be aware of limitations and accommodate them, as well as be tolerant of those who do not understand or recognize the limitations.

Comment. There are certainly issues with bandwidth, however, the participants' communications are not intended to be real-time. I think real-time chats might be valuable in the future, but they are not critical for the success of virtual interactions.

Comment. We could do more with better technology, but we get along OK.

Comment. There are many forms of communication at our fingertips. Bandwidth is not a limit in my circumstance.

Questionnaire #3 comments:

Comment. We humans communicate across a wide spectrum of verbal and non-verbal signals and information transfer, and by definition, the virtual environment limits a large portion of this bandwidth.

Comment. Obviously, one's answer to this question is totally dependent on how they define "right messages." In our case, the mixture of virtual and FTF interactions used relieves us of the "need" for high-bandwidth technologies such as videoconferencing. I have found that we are more being "pulled" into new ways of communicating by new technologies than being "pushed back" from communicating the way we want to by limitations in technology.

Comment. This is changing, but so is the message!

Comment. Not everyone has the text-based verbal skills to express themselves fluently in e-mail and documents. But then there's always the telephone. Some team members may not be proactive in communication what's on their minds, and bandwidth may not be the solution.

Comment. I believe that as the need for distributed groups is realized, technology will provide what is needed. At this point, a project could be structured that is not limited by bandwidth by increasing the FTF experiences.

Aspect 22: There was a perception that some team members were not really working (out of sight, out of mind).

Questionnaire #2 comments:

Comment. That tended to be within the rank and file of the team, and was for the most part quelled by the team leader. It is his/her duty to keep everyone aware of what one might be doing, as well as why someone might be quiet for a while. This is however, true management by objectives, and the objectives being met speak for themselves.

Comment. I strongly agree. The official communications never stated this, but it's the feedback I received from trusted peer members at the headquarters location. For their part at headquarters, my peers were subject to higher work loads and additional stress due the management techniques employed by the then-current boss (e.g., "Drop what you're doing, get over here, this is the way we're going to do it from now on!"). Virtual members weren't subjected to much of this frantic activity, and maybe some resentment and negative perceptions developed.

Comment. Perception? We're on a team with programmers. Everyone knows they don't work. Okay, joke. I think that perception is omnipresent in any virtual or telecommuting environment, particularly where there is a lack of understanding of others' jobs.

Comment. I don't think participants felt others weren't working, especially because everyone can see the deliverables each person posts to the class data-

base. The only time this perception becomes a reality was in the case of the few participants who dropped out (and, therefore, truly weren't working).

Comment. This thought occurs easily to a manager or team leader. It requires a light touch with oneself, and in any conversation with a team member in which the thought comes up. Sometimes we even joke about it. Today I asked a team member, "Are you busy right now?" and he replied, "Are you my boss, or as someone who needs something done right away?" Focusing on positive achievements, and having plenty of them to focus on, keeps the anxiety at bay.

Comment. Dependent upon individuals not location! People in the same office can appear out of sight/mind too.

Questionnaire #3 comments:

Comment. As previously mentioned, my team was a hybrid, with most people at a central location and about a third of us scattered around the country. This reality may have affected the attitudes of team members at the central location. I do believe they were under more stress than the rest of us, and that they therefore may have felt "put-upon" by those of us who weren't there on a daily basis. Maybe the best configuration for a virtual team is one where all team members work in a virtual setting.

Comment. Or that they have set themselves to an easy schedule because few people were there to check up on them. You can never change that issue completely. It always has and always will be a problem. Especially when

someone becomes behind schedule with a single item deliverable. There are no intermediary products that show progress.

Comment. The team leader remains susceptible to these ideas.

Comment. Unfortunately there was some of this. In retrospect, this was attributable to lack of management rather than the mode of team involvement.

Comment. Results were the indicator of an individual's work. It should not be a concern of team members as to the question of the individual's work effort or habits unless results are not achieved.

Summary of Question 13 and Question 13 Aspect Statement Responses

There was little overall agreement on the four aspect statements. Responses to both questionnaires #2 and #3 were actually rated less than "4" or less than "agree." There were a variety or range of experiences on teams. In general, some teams experienced communications problems related to time delays, while other teams didn't. At least one team that didn't experience many time related communications problems used a variety of communications devices such as pagers and cellular telephones in addition to standard telephones and e-mail. In addition, some non-technical approaches were used such as scheduling telephone calls in advance and making it a habit to check voice mail frequently. A few respondents experienced the "out of sight, out of mind" problem, but interesting, most respondents didn't think this was a problem.

Question 13. What were some of the major problems or challenges attributable to working in a virtual environment (e.g., trust, collaboration, leadership, communicating, decision-making, team or individual focus)?

There were 12 responses to this question in questionnaire #2. There were 9 responses to this question in questionnaire #3.

Table 4.5

Distribution of Response Data to Aspect Statements of Question 13

Aspect Statement	Mn Q2	Mn Q3	Md Q2	Md Q3	Rg Q2	Rg Q3
19. Time delays in responding to e-mail messages or telephone calls were a common or frequent communications problem	3.50	3.11	4	4	2-5	2-4
21. Current technology bandwidth is insufficient to carry the right messages (e.g., real-time human and social cues).	3.50	3.67	2,5	4,5	2-5	2-5
20. It was often difficult to reach people because there was no visibility of when people were out of the office due to meetings, travel, vacation or illness.	2.50	2.44	2	2	1-5	1-4
22. There was a perception that some team members were not really working (out of sight, out of mind).	2.50	2.2	2	2	1-5	1-5

Note: Mn refers to mean, Md refers to mode, and Rg refers to range.

Analysis and Findings from the Case Study and Comparison with the Delphi Study

There are many different ideas about what leadership is. Almost every writer has his or her own definition. Fortunately, there is sufficient overlap in these definitions and leadership practices that there is some general agreement.

This section explores various practices or aspects of leadership that are considered important by researchers in leadership and evidence of these practices or aspects found in the case and Delphi studies. The case study team is referred to as the ABC team in the remainder of this chapter.

Effectiveness

Was the leadership of the ABC team effective? The mission was accomplished. The ABC conference was successfully held in November 1996. Yukl (1994), a leading researcher on leadership in organizations, would answer the question this way:

The most commonly used measure of leader effectiveness is the extent to which the leader's organizational unit performs its task successfully and attains its goals (p. 5).

From the perspective of the accomplishment of its mission, the ABC team leadership would have to be considered effective.

Several team members responded about the success of the ABC team and gave credit to the team's leadership. One team member summarized team success this way.

I have experience in other remote teams that give insight, but the program committee is structured in a way that it WORKS even though people are around the world.

Another team member looked at team success specifically through the perspective of team leadership.

I believe this team succeeded because there was strong and thoughtful MANAGEMENT going on. The co-chairs are good leaders and I believe leadership (in any team) makes all the difference

in the world. There is NO substitution for leadership, particularly in this type of virtual environment.

The successful experience of the case study was typical of what was observed in the Delphi study. Only one of the 13 teams in the Delphi study failed to complete their goals. Successful completion of goals does not mean there were no problems; on the contrary, there were lots of problems—many attributable to working in a virtual environment—but that the teams were successful in solving their problems and accomplishing their mission.

There are also other perspectives of effectiveness. One such perspective is consideration of team members. Does the leader satisfy the needs and expectations of team members? Do team members resist leadership? Do team members work together? A team may meet the established objectives, but if the team members would not want to work together or with the team leader in the future, team leaders would not be considered effective. This perspective was not explored in either the Delphi or case study. Another perspective of team leadership effectiveness is the leader's contribution to the quality of group processes (Yukl, 1994, p. 6). For example, does the team leader enhance team work, communications, decision-making, or conflict resolution? This perspective was not explored in either the Delphi or case study. These perspectives of leadership effectiveness could be another study.

Team Structure

One team member described the overall team structure this way. “The ABC team was a fairly large team, very flat, and very highly distributed.” In fact,

the structure of the ABC team was not as flat as it seemed to some of its members. It appeared flat to those team members who generally worked independently on individual work products with limited interaction with other team members. This arrangement worked effectively for some tasks resulting in a successful conference.

However, in those cases where the work products were sufficiently complex and time consuming that one person could not do them, the responsible team member also led a sub-team to accomplish the work. For example, the team member who lead the Papers Committee had about twelve Associate Chairs and about fifty reviewers. There were some other complexities in the team structure as well. For example, some team members had a dual reporting role and some team members were on two or more committees.

The structure of the ABC team was in marked contrast to the structure of the teams in the Delphi study. Whereas the ABC team was fairly large, with 34 people on 24 committees with dozens of other people in various supporting roles, teams in the Delphi study generally were under 10 to 12 people with a very flat structure. The following example is one of the few exceptions, but here again its structure is very flat.

[The XYZ publisher] and I were the editors, the rest of the 100+ team were authors of individual chapters.

Face-to-face Interaction

Team leaders considered face-to-face interaction important as seen from the number and importance of these meetings. Despite difficulties in bringing

people together, two major face-to-face team meetings were held before the conference—a team meeting in February 1996 and the Program Committee meeting in June 1996. Other, smaller meetings were held by various team members who were geographically collocated. Face-to-face contact was considered important by several team members for different reasons. One team member put it this way.

I believe in face-to-face interaction on a limited basis, enough to preserve the 'human aspect' of the business, for example, matching a voice to a face, eye contact, and so on.

Face-to-face contact helped in other ways such as building trust for some team members, as this example illustrates.

I met them (committee members) several times and it was a trust building experience—both ways. There was good partnership because there was a healthy respect for the fact that each party brought to the table differing skills that would be necessary to produce a successful result.

In addition to interpersonal interaction and building trust, three additional perspectives of meeting face-to-face are provided below. These perspectives revolve around the exchange of information and problem-solving.

I have to deal with a bunch of problems that it would be nice to meet in a room and thrash them out. It's not so much meeting people as it is coordinating the various inputs. I talk to somebody and he gives me information that other people don't have. It's having all the information universally shared that face-to-face provides.

Committee meetings were face-to-face, and it was valuable to meet together. A lot of group opinion, interaction, ad hoc subgroups, exchange of physical materials, and individual networking was accomplished via meeting.

We had one group meeting in February prior to the conference. This was a two day meeting to organize and handle issues that affected everyone. This meeting was very important, since many issues were very complex and could not be resolved easily by e-mail.

Face-to-face contact was clearly important for most team members.

Communications, problem-solving, team building, exchange of information and materials, and trust were all enhanced through meeting face-to-face. And yet, some committees never met face-to-face at all.

The Delphi study also found a variety of experiences regarding face-to-face interaction. Some teams thought face-to-face interaction to be very important while other teams did not. One example where face-to-face interaction was considered important was this.

Face-to-face is VERY important. You yell at the girl from Bell when your phone bill is messed up, not because she is responsible, but because you do not know her face. Once you have met, you have more compassion and understanding for your fellow team members.

This example from the Delphi study is similar to many of the opinions expressed in the case study. Compassion and understanding are factors in trust and team work.

Although face-to-face meetings were important in this case study and in many of the Delphi study teams, some virtual teams can work successfully without ever meeting. For example, one Delphi respondent reported.

We never met face-to-face during this project. I don't think it was necessary to have that contact in this instance. This was an upgrade of an existing product, so everyone had fairly substantive knowledge and expectations of the product.

This example provided a different insight into virtual teams than was found in the case study--the perspective of the context or situation of the team. In the example above, the situation was stable and the problem statement was well defined and relatively straight-forward.

Trust

Trust is one of the most important factors for team leadership. Evidence of trust was found in two ways in both the case and Delphi studies. First, team members were given significant tasks to accomplish and they generally worked remote from team management. Second, face-to-face meetings help to build trust for some team members. See previous examples on face-to-face interaction and trust in this section. Handy (1995), a British management consultant and author of several management books, put trust in this perspective:

If we are to enjoy the efficiencies and other benefits of the virtual organization, we will have to rediscover how to run organizations based more on trust than on control. Virtuality requires trust to make it work. Technology on its own is not enough (p. 44).

Given the geographic distribution of the team and the length of time team members worked in primarily a virtual environment, it is clear that the team leaders trusted team members to complete their tasks. At the same time; however, team members risked their professional reputations if they failed to deliver.

Collaboration

While some team members undoubtedly collaborated to accomplish their tasks, there were few references to collaboration in either the case or Delphi

study responses. Looking at collaboration from the perspective of Schrage (1990), the author of Shared Minds, one of the key rules or heuristics for effective collaborating is shared space:

If there isn't some sort of shared space—if there isn't a clear, explicit place where individuals can jointly create value—a yellow pad, a white board, a computer screen, a prototype, etc.—then the chances are you aren't collaborating (p. 223).

While some team members on some teams may have had a shared space for collaboration, the teams as a whole did not appear to have a shared space.

Fostering collaboration is considered one of the ten best commitments or practices of leadership by two researchers on leadership (Kouzes & Posner, 1995). But then, considering the relatively independent nature of the work of the committee chairs, collaboration was not generally required. Collaboration may have been very important for some sub-teams where collective work products were produced. The subject of collaboration in a virtual environment may be a good candidate for further study.

Electronic Communications

While face-to-face contact was limited in the case study, electronic communications were used extensively. E-mail and the telephone were the primary information and communications technologies used. This was one aspect that everyone agreed on. The volume of e-mail varied considerably. One team member received over 200 e-mail messages during a six month period of time while another team member reported sending and receiving only a few messages. Lotus Notes was used to manage the review process which included

reading and selecting the papers to be presented at the conference. U.S. Mail and Federal Express were used to mail documents. Computer supported cooperative work applications such as Lotus Notes were not used by everyone because not everyone had access to the required communications infrastructure. It was interesting to note that while ABC researchers are considered experts in computer supported cooperative work, only e-mail was used by the team.

Most respondents to the Delphi study considered e-mail and the telephone to be the primary information and communications technologies used as well. However, most Delphi respondents were not considered expert in computer supported cooperative work technologies. One team leader used telephone conferencing successfully to keep everyone up-to-date. This method required pre-planning and discipline to execute successfully. Team members had to be willing to set aside specific times for team communications even if it occurs during non-working hours.

Coaching, Encouragement, and Rewarding

There were few examples of coaching, encouragement, or rewarding found in the case study; however, there were several good examples provided by respondents to the Delphi study. The following example was one of the few examples found in the case study on these subjects.

Coaching, rewarding, and encouraging did happen by e-mail, but this was generally part of the overall discussion and not a specific e-mail.

Two examples from the Delphi study are the following comments.

Challenged, encouraged, and coached are at the very nature of the editing and authoring process.

Each team member, partners and associates, were responsible for the assignments and highly encouraged to interact with other members to identify problems, work tasks, and reward efforts by others.

Not all respondents from the Delphi study offered positive examples; many examples were negative. However, in general, the responses were positive.

These are good practices for leaders, even in virtual teams because they not only make people feel better about their work, but also performance may be improved. A follow-up study on virtual coaching might be another interesting area of research. Yukl (1994) covered the subject this way.

Positive reinforcement has been the subject of extensive research for several decades in psychology, and a strong interest in positive reward behavior (usually defined as a combination of contingent rewards and recognition) can be found in the leadership literature. Similar results were found in most subsequent studies measuring contingent reward behaviors by leaders. Together these related lines of research indicate that contingent rewards often increase subordinate motivation and satisfaction, even though results were not significant in every study (p. 134).

Common Vision

A common vision, purpose, or goal agreed to by all team members is very important for both commitment to the job and for understanding the job. In the case study, it was clear to all team members who volunteered. This conference is held every two years. Everyone knew this. Team leaders did not have difficulty with this aspect of the team. The situation was similar for the Delphi

respondents. While they were not volunteers, they worked on projects with clear objectives.

Ground Rules

Effective teams need to shape their own ground rules or group norms. There was little evidence found in the responses or collected artifacts on group norms in either the Delphi study or the case study. There may or may not have been a set of established group norms. The data were inconclusive. It is possible that some of communication problems experienced may have been mitigated if teams had developed group norms related to team behavior in communications.

Learn from Experience

There was little evidence found in either the case or Delphi study, but then again this was not an area that was fully explored. It seemed from some case study interviews that team members did not have access to historical data. Some team members expressed difficulty in completing tasks for a variety of reasons such as limited or lack of knowledge of: who could help them, how to ship physical items, conference room configurations, event interdependencies, possible help or assistance available at the conference itself, and in general all the typical problems that come up.

This is an area that team leaders could influence by documenting “lessons learned” at the end of a conference and by providing the following team a copy of a well documented project workbook. Note: This researcher found out in a

conversation with a team member at the close of the conference that historical data was actually collected. A final report was created and handed to the next team. In addition, conference participants were surveyed and the information was distributed to at least some team members.

Individual Recognition/Team Celebrations

Kouzes and Posner (1995) consider individual recognition and team celebrations to be two important commitments or practices of leadership. Yukl (1994) would agree with Kouzes and Posner. He wrote, "Recognizing is one of the most neglected managerial practices, even though it can be one of the most effective for increasing commitment and job satisfaction" (Yukl, 1994, p. 130).

The primary team celebration for the case study team occurred at the end of the conference in Boston. It was a social event with refreshments and dinner. Recognition and other celebrations occurred throughout the conference planning process. For example, the Program Committee met for dinner in Ann Arbor in June. Praise and thank you messages were sent via electronic mail for jobs well done. At the end of the conference, one team member wrote.

Now that the conference has come and gone, I just wanted to send a note of thanks to all of you who submitted. . . . I appreciated all of your hard work in creating materials and getting them to me on time throughout the process.

Recognition and celebrations are important practices of team leadership. While it can be difficult to meet face-to-face, the thought and expression of rec-

ognition is important and sending these thoughts electronically is certainly better than no recognition at all.

Respondents to the Delphi study gave a wide variety of comments on recognition and team celebrations, but in general there were few team celebrations at the close of a project due to the time and costs involved in bringing people together face-to-face. On-line recognition was given in different ways such as by a private telephone conversation, e-mail, or telephone conference. One significant reason for a team celebration in the case study example is that the team members were already physically together at the end of the project—the conference itself. It was not necessary to incur the expense and time to bring people together at the end of the project.

This is a subject that team leaders could likely improve on. Perhaps a survey could be used to determine what team members think about recognition and celebrations and how they should be practiced.

Communication

Communication with other people is difficult enough in face-to-face situations. It can be a serious problem in virtual environments for such reasons as time delays in replies, misinterpretation of the meaning of messages, and misinterpretation of intent (without normal social cues to help). Communication is a critical success factor (something that must be done well) for team leaders.

Working in teams can be frustrating for a variety of reasons and working as a team in a virtual environment across multiple time zones only adds com-

plexity to interpersonal dynamics and project visibility. One team member in the case study described the frustration and difficulties this way.

How hard it is. The work is not my main work. It is occurring intermittently and at odd hours—late at night. When I'm working on it, they're (other team members) not. I would say that it is a lot harder not having ready communication with other team members, especially when I have no sense of their progress. . . . It would be nice to have a timeline or project milestone that we could all see. We have no status review or project visibility. As chair, you see it all, but don't realize that other people don't. . . . Each of us need to be thinking of the rest of the team.

This last comment, “each of us need to be thinking of the rest of the team” is very important for team members because thinking about the rest of the team is the first step in actively communicating and collaborating with them.

Another team member commented that if the team had been physically collocated, coping with the frustration of communication would have been easier. In addition, team members would have been able to develop or improve relationships and readily exchange or share information. There is clearly a downside to working in a virtual environment—some things are simply lost. For example:

It might have been easier to tell if people were in town versus on vacation. When critical information was needed, I could have looked for them in their offices. We might have shared more informal information over lunch and so on.

The theme of frustration with communication problems came up frequently in the case study. One team member had this comment about collocation and communication.

Some information would have been easier to get if we were collocated. One chair was particularly non-communicative by e-mail,

which made my job very difficult. Had we been collocated, I could have tried to resolve some issues face-to-face.

Another team member made this comment about working with another team member.

The [chair] was a nightmare to work with. [The chair] would not give any specifics about what he wanted.

The comments above were clearly highlighted by this comment from another team member. This comment vividly illustrates the importance of face-to-face interaction.

A core of the team was collocated. The chairs said they couldn't count the number of times they walked over to one another's offices. So the operational and decision-making core was collocated, but the rest were not.

A final example from the case study was this general comment on communication. This example clearly illustrates the frustration and delays that can occur in a virtual environment with electronic mail being the only way to reach someone.

Not being able to get a response from people as soon as you like. Weeks can slip by and we are all doing other jobs. You send out a question and in some cases an answer never comes back. You don't know how to interpret it. They don't want to answer or what.

The three hour time difference between the East Coast and the West Coast combined with busy schedules made telephone conversations difficult to establish. "Telephone tag" was a common and frustrating experience.

One respondent to the Delphi study explained the time zone problem this way.

Because of the geographic and time zone differences, there was only a three hour window in which timely communication could occur. Otherwise a team member would wait at least a day for a response to a question or other concern.

It's clear that face-to-face interaction in communication is not going to be completely replaced anytime soon. We still need to meet, at least at times, to work through some problems. Face-to-face interaction removes many barriers to effective communication, reduces or even eliminates time delays, and provides an opportunity to exchange much more information than is currently possible with information and communications technologies.

Overall Assessment of Working in a Virtual Environment

There were differences of perspective regarding working in a virtual environment in both the case and Delphi studies. At least one team member in the case study felt isolated and not really part of a team. This person "missed interaction with other people." A similar perspective from another team member was voiced in this comment.

It does not substitute for a real environment! [But] sometimes it was nice not to have to respond to different cues.

Another example from the case study, which also expressed the nature of working isolated from other team members, was this.

The lack of warmth—of a real person. The immediacy of access of other people to respond via e-mail—feedback. The telephone solved some of the problems. There is a hierarchy of means. There is a lack of means to deal with urgent issues—e.g., you cannot simply go looking for someone who is not in (at their desk), but might be around the corner or at the coffee pot.

Another team member in the case study agreed with the comment above by expressing the difficulty in this way. “We are a distributed committee, not a team.” In other words, this team member believed that the team was not cohesive enough to be a real team but that it was more of a collection of individuals or a work group. This feeling was expressed by other team members in different ways.

One respondent from the Delphi study offered this comment about the potential for being lost in a virtual team.

In a virtual environment, participants can easily become lost if they feel they are not receiving communications or being informed of the happenings. Frequent communication is critical.

Some team members were frustrated for a variety of reasons by working in a virtual environment and yet other team members liked it. One team member from the case study offered this positive comment.

The virtual team concept is very attractive to me in that it provides freedom of time and space, in spite of deadlines. For this reason, collocation is irrelevant.

Yet, collocation provides options in communication not generally available in a virtual environment. These options include the same communication options found in the virtual environment such as the telephone and electronic mail plus the option of meeting face-to-face and the additional possibility of finding the person you have been trying to reach by the “water cooler.” Collocation also provides the possibility of meeting over lunch or meeting after work. Communication can be supplemented by team building.

There was no real consensus on the upside or downside of working in a virtual environment from team members in either the case study or the Delphi study. For some team members, it was a positive experience, and yet for other team members, it was isolating, frustrating, and difficult. On the other hand, for these projects, there was no real alternative to working in a virtual environment at least part of the time.

Summary of Case and Delphi Study Findings

Responses from both the case and Delphi studies were remarkably similar. The case study team and teams in the Delphi study were generally successful in meeting their goals while working in a mixed environment of face-to-face interaction and electronic communication. Both case study and Delphi study teams experienced problems in electronic communication; coaching, encouragement, and rewards were limited; there was little evidence of learning from previous experience; there was limited individual recognition and few team celebrations; and some general frustration of working in a virtual environment. Finally, face-to-face interaction is still very important in most teams.

The case study seems to confirm what was found in the Delphi study and vice versa. Taken together, both studies confirm recently published reports on virtual teams. For example, one reported problem was identified by Snizek (1995):

The tendency for full-time telecommuters to quickly feel a sense of isolation from fellow workers and the larger organization. This alienation can be minimized by bringing telecommuters to a central location for periodic meetings (p. 16).

In other words, face-to-face interaction is still required at times. The sense of isolation was also expressed by some respondents in both the case and Delphi studies.

Barner (1996) identified some of the implications in virtual teams and wrote as follows:

First, people will need to develop specialized communication and planning skills to succeed in the virtual work environment. Second, managers and team members will have to form clear upfront agreements regarding: (1) performance expectations; (2) the team's priorities; (3) how communications are to be carried out among members; and (4) the degree for resource support (p. 14).

Both the case and Delphi studies looked at performance expectations via the team's mission. Team ground rules were not explored in detail, but they clearly map to item 3 above—"how communications are to be carried out among members."

In general, the outcome of both the case and Delphi studies indicates far more commonality than difference. Follow-up studies exploring leadership in virtual teams in greater detail will likely find more specifics.