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DISSERTATION

VIRTUAL TEAMS: WORK PROCESSES, COMMUNICATION, AND TEAM DEVELOPMENT

submitted by:

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In partial fulfillment of the requirements

for the Degree of Doctor of Philosophy

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Spring 2000

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COLORADO STATE UNIVERSITY

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WE HERERBY RECOMMEND THAT THE DISSERTATION PREPARED UNDER OUR SUPERVISION BY ELAINE A. LEMAY ENTITLED VIRTUAL TEAMS: WORK PROCESSES, COMMUNICATION, AND TEAM DEVELOPMENT BE ACCEPTED IN AS FULFILLING IN PART REQUIREMEN6TS FOR THE DEGREE OF DOCTOR OF PHILOFOPHY.

Committee on Graduate Work

Advisor

Department Head

ABSTRACT OF DISSERTATION

VIRTUAL TEAMS: WORK PROCESSES, COMMUNICATION, AND TEAM DEVELOPMENT

The purpose of this study was to understand the work processes, task and social communication, and team development of virtual teams. Virtual teams are groups of geographically dispersed co-workers that work together using information technologies to communicate. The study uses a grounded theory approach.

To meet the demands of global competition, organizational structures are changing and becoming more flexible. The new organizational workplace will not be bound by geography, time, or organizational boundaries, but will be more of a virtual workplace where productivity, flexibility, and team collaboration are critical for success. Therefore, the number of organizations using virtual teams is growing dramatically and there is every indication that this new form of team will continue.

The research on virtual teams has focused on 1) communication in virtual teams, 2) decision making in virtual teams, 3) interpersonal relations in virtual teams, 4) trust in virtual teams, and 5) development of virtual teams.

The virtual teams in this study were MBA distance education students assigned to complete a communication audit as a class project. The teams were responsible for administering the audit, analyzing the results, and writing a report. The research involved

analyzing the on-line team meetings to understand how the teams worked together, communicated, and developed as teams.

Five common work processes were identified for the teams participating in this project. The work processes were 1) self-management, 2) volunteerism, 3) an absence of conflict, 4) similar decision making processes, and 5) similar team protocols.

All of the teams spent significantly more time in task communication compared to social communication. However, the social communication did increase the longer the teams worked together.

The teams in this study followed the stages of team development as proposed by research on co-located teams. Although each team progressed at a different rate they all moved through at least three stages of task and process development. The teams moved through more stages of task development than social development.

This project confirmed prior research on virtual team communication and developed knowledge on how virtual teams work together and develop.

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CHAPTER 1: INTRODUCTION

A team of software developers includes employees located in the United States, Sweden, and India. The work is usually initiated in the U.S. and at the end of the workday the U.S. team transmits its files via the internet to the Indian team, which works on the project until the end of their workday. The Indian team then sends its work on to the Swedish team, who forward the work back to the U. S. team at the end of their work day. The U.S. team then picks up the files and continues the production cycle (Roberts, et al, 1998)

This is one example of how virtual teams are changing the way organizations do work. But, is the group of software developers described above really a team? Do they develop, make decisions, communicate, resolve conflict, and become cohesive just like teams working in the same location?

In today's world of fast moving global markets and fierce competition the windows of opportunity are often very brief. In this business environment organizations adapt quickly or die. Many large organizations have found themselves questioning the way their businesses are organized. They are looking for ways to meet the demands of a fast changing marketplace and are redesigning their organizations to be more flexible and versatile. Gaining a competitive advantage in a global environment may mean continually reshaping the organization to maximize strengths, address threats, and increase speed (Quinn, 1991).

One popular response to this challenging new work environment has been to outsource a number of organizational functions, replacing traditional structures with an interorganizational network or virtual organization. The emergence of the virtual organization is largely a response to highly competitive operating environments brought

about by increased global competition and advancements in information technologies (Duarte & Snyder, 1999).

Organizations adopt a virtual organizational strategy to share facilities, resources and core competencies, share risk and infrastructure costs, respond quickly to opportunities, share markets, customers, and market loyalties, and combine skills and services into unique solutions.

The virtual organization has been defined as a temporary network of independent companies, suppliers, customers, even rivals, linked by information technology to share skills, costs, and access to one another's markets. It will not have a central office nor a traditional organizational chart. Instead, this new evolving corporate model will be fluid and flexible—a group of collaborators that quickly unite to exploit a specific opportunity (Byrne, 1993).

The virtual organization has been the topic of over fifty articles and has been embraced by organizations in a variety of industries (Buckley, 1999). This new organizational form comes at a time when increasing global competition and recent advancements in information technologies have forced organizations to reevaluate their structure and work processes. Many organizations have downsized and there are continuing pressures to implement increasingly flat or horizontal organizational structures. While these new organizational structures may create more efficient organizations, flat structures disperse employees both geographically and organizationally which makes it more difficult for the members to collaborate and more difficult for managers to manage dispersed employees (Townsend et al, 1996).

The use of teams has become a common way of implementing virtual organizations. Forming teams allows organizations to utilize talent quickly from different functions, locations, and organizations (Duarte & Snyder, 1999). The methods that organizations use to manage this process can mean the difference between success and failure. Organizations that do not use virtual teams effectively may lose in the competitive, ever-changing marketplace. Therefore, understanding how to work in or lead a virtual team is becoming a fundamental competence for people in many organizations (Duarte & Snyder, 1999).

People who manage virtual teams face special challenges. Although many traditional leadership principles apply to virtual teams, there are also some unique aspects to managing virtual teams. When managing a virtual team it is difficult to manage by walking around and manage by observing. Managers of virtual teams may need to find new ways of measuring performance, training and mentoring new employees, understanding what employees are working on, and communicating with virtual employees (Haywood, 1998).

Problem Statement and Context

To meet the demands of fierce global competition, organizational structures are changing and becoming increasingly more flexible. The "new" organizational workplace will not be bound by geography, time, or organizational boundaries but will be more of a virtual workplace where productivity, flexibility, and team collaboration will be critical to success. The ability of people to use multiple communication forms such as e-mail, voice mail, tele-conferencing, internet, chat rooms, etc. has given people the ability to work together without being in the same location. This ability to work anywhere,

anytime, with anybody has created virtual organizations. The virtual organization can take many forms from pure networked organizations to members of the same organization who are in different locations but belong to the same team, to a mix of employees and consultants working together on a project. Each of these examples is a virtual team that works together to accomplish organizational goals.

Unlike conventional teams, a virtual team works across location, time, and organizational boundaries linked by communication technologies (Lipnack & Stamp, 1997). Virtual teams address the needs of a new work environment where flexibility, rapid change, and the need for expertise are on-going and critical to effectively compete in a global environment. As companies increase the use of virtual teams in their organizations one of the biggest issues the company will face is how to get all of the individuals working in the virtual environment to work together compatibly, effectively, and efficiently. This needs to be done even though they may rarely see each other and the majority of their communication will be done via computers, phone, and fax.

Researchers are beginning to study virtual teams but most of the research has been in college computer labs using short-term team assignments. Most of the research on virtual teams has involved analyzing how computer-mediated communication systems (CMCS) affect communication, group development, and decision making in virtual teams compared to co-located teams. Communication research and team development research on virtual teams has been intertwined because they are so closely related – group success is dependent on effective communication and knowledge sharing among group members (Townsend et al, 1998). So, there is a direct link between communication effectiveness and team effectiveness.

Purpose Statement

The purpose of this study is to understand and describe how virtual teams work together and the group development process and communication used in virtual teams using a grounded theory approach. The study will seek to answer the following questions 1) How do virtual teams work together to accomplish their objectives, 2) What is the mix of task and social communication during virtual team meetings, and 3) What team development process is used by virtual teams? I would like to discover information that will help organizations that are implementing virtual teams and managers that are managing virtual teams.

Research Questions

Research questions for this study include:

1. How do virtual teams work together?
2. What is the mix of task vs. process communication on virtual teams?
3. Do virtual teams go through the same stages of team development as co-located teams?
4. Is there another model of team development that better fits virtual teams?

Definition of Terms

Terms that need to be defined for the purpose of this study are virtual organizations, virtual teams, virtual team models, and how virtual teams work together using technology.

Virtual Organizations

The term, virtual organization was first introduced by Davidow and Malone (1992) to describe a strategy that provides organizations with the tools necessary to

survive in an environment of uncertainty that requires the quick mastery of both information and relationships. These authors predicted that a virtual organization will appear seamless with permeable and continuously changing boundaries between organizations, suppliers, and customers. Inside the organization, departments and divisions will reorganize according to need and job responsibilities and authority structures will realign themselves according to projects.

Goldman et al (1995) also view the virtual organization as a way to help organizations survive in a rapidly changing, opportunity-based environment. To compete, organizations will need access to a wider range of competencies than any one organization can afford to maintain "in between" opportunities or can identify in advance of unanticipated opportunities. The virtual organization will be able to assemble resources quickly, frequently, and concurrently. The key characteristics of the virtual organization include adaptability, opportunity-based, and defined integration of core competencies distributed among several organizations. It will also include a limited lifespan; an ability to synthesize the skills of dispersed people and competencies into a coherent productive resource in addition to trust, open and honest communication, and compatible values among members.

A virtual organization allows organizations to share facilities, resources, core competencies in order to increase their expertise, size, and ability to do business on a global basis. A virtual organization will have the ability to respond quickly to opportunities or problems, to share markets, customers, and market loyalties, and to combine skills and services into unique solutions (Goldman et al, 1995).

Teamwork in the virtual organization is essential in order to unite the diverse units involved in the virtual organization, engage the best talent, capitalize on each person's key competencies, share knowledge, and create the highest quality and fastest response to customer needs.

Virtual Teams

Virtual teams are groups of geographically and/or organizationally dispersed co-workers that work together using a combination of telecommunication and information technologies to accomplish a task or goal (Townsend et al, 1998, Sessa et al, 1999). A virtual team has members dispersed across distance and time (Lipnack & Stamp, 1997; Sessa et al, 1999). The main factors that make teams virtual include: geographical separation of team members, skewed working hours, temporary or matrix reporting structures, and multi-corporation or multi-organizational teams. (Haywood, 1998).

Henry and Hartzler (1997) state that virtual teams have the following characteristics: members are mutually accountable for team results, members are dispersed geographically, members work apart more than in the same location, the team solves problems and makes decisions jointly, and the team usually has less than 20 members. Townsend et al (1996) state that a virtual team is characterized by the fact that its members primary interaction is through some combination of electronic communication systems, such a email, on-line chats, telephone, fax, and video conferencing.

The imperative for developing virtual teams in organizations comes from seven specific factors 1) increasing use of horizontal organizational structures 2) business strategies that require inter-organizational cooperation 3) changes in employee's

expectations of organizational participation, 4) the shift to service/ knowledge work environments 5) increasing globalization of trade and corporate activity 6) the need for faster development and response times in order to remain competitive and 7) the need to share knowledge throughout the organization and tap into employee expertise no matter where they are located (Townsend et al, 1996; Sessa et al, 1999). Case studies and surveys of virtual teams help to demonstrate some of the advantages and disadvantages of virtual teams.

Advantages of Virtual Teams

Virtual teams can lead to increased productivity, closer ties with customers, increased flexibility, twenty-four hour work cycles, greater access to technical experts, and better communication through the use of shared databases.

Increased Productivity

Many studies confirm that telecommuters show productivity increases between 15-80 percent with an average increase of 30 percent. Haywood's (1998) studies indicate that productivity increases are not just relevant to telecommuters. Employees working on projects in different geographical sites also reported productivity increases due to more structured communication and less interruptions.

Closer Proximity to Customers

Some organizations have located their employees at their customer's sites rather than in their own offices. Customers then have immediate access to the people who are providing technical and/ or project support. In 1995, Xerox closed its Waltham, Massachusetts, office and sent 5500 sales and support personnel to work at customer sites. Xerox reported that increasing product complexity required employees to spend

more time working at client sites. In addition, by placing employees at the sites they were able to more efficiently meet customer's needs.

Increased Flexibility

Virtual teams allow an organization to create teams on an as-needed basis. Organizations can form and disband teams easily to address problems or projects. Verifone formed a task team to develop ways to reduce the time required to fill customer's orders. The group was comprised of people from many locations, functional units, and levels within the company. The group used e-mail, audioconferencing, and videoconferencing to communicate with each other. The team's recommendations had a major impact on increasing the speed with which the company services its customers (Pape, 1995).

Many groups and small organizations are forming networked organizations that work as virtual teams. These networked organizations can be very flexible and change rapidly in order to meet competitive demands. Many networked organizations do not actually produce what they sell. Instead, independent companies under contract to the network organization carry out all production-related and marketing functions. An example of this type of organization is Galoob Toys, Inc. (Kreitner, 1997).

One hundred and fifteen employees run the $58 million Galoob operation. Independent inventors and entertainment companies invent most of Galoob's products, while outside specialists do most of the design and engineering. Galoob farms out manufacturing and packaging to a dozen or so contractors in Hong Kong. When the toys land in the United States, commissioned manufacturer's representatives distribute them. Galoob does not even collect its accounts. It sells receivables to Commercial Credit

Corp., a factoring company that also sets Galoob's credit policy. The Galoob employees work virtually with all of the networked parts of the organization.

On-going – 24 hour work

Virtual team members can complete their portion of the work on a project anytime, anywhere. Virtual teams can use a process known as "following the sun." This process allows organizations to view time zones as an opportunity instead of a nuisance. They can capitalize on the idea that at any given time somewhere in the world people are working, so work can move from a team member or a team through time zones. Virtual teams can be extremely effective. For example, if you can have people working in Germany – five hours ahead of you – and they can hand work off to people in Chicago at the end of their day. Then, at the end of the workday in Chicago the work can be handed back to Germany or passed on to Taiwan (Melymuka, 1997).

Because virtual teams can work both asynchronously and/or synchronously, work can be on-going in addition to providing high flexibility to the team members. For example, a consulting company recently had a client with an urgent request for some industry comparison data. The company has a database both in their U.S. and European offices. So, at 7:00 p.m. U.S. time the U.S. employee sent an e-mail to a colleague in Europe asking them to work on the client's request first thing in the morning so that first thing the next morning (in the U.S.) she could get back to the client. She had the information on her client's desk by 9:00 a.m. the next day. This is an example of work being handed off to another time zone, so the work can continue and a client's request honored in the shortest time possible.

Greater Access to Technical Experts

Using virtual teams allows an organization to access technical experts and advice without the experts needing to move to another location in order to contribute to a project or problem. This means teams will be made up of the best workers, regardless of their location and outside experts can easily be included. Membership can also remain flexible and changeable because there is no location or lag time restrictions (Henry & Hartzler, 1997; Townsend et al, 1996).

For example, an oil company with a serious technical problem in southeast Asia could ask for help from technical experts now located in Alaska, Texas, and South America. These technical experts could be assigned to a short-term project team to help resolve a drilling problem in Indonesia.

Virtual Teams can also enhance the availability and cost effectiveness of consultants from outside the organization. Teams that need a specific level of expertise for only a few hours may be able to access that expertise without bringing the consultant on-site, eliminating the travel expenses.

Shared Database

Most virtual teams maintain some type of shared database where team activities are documented. One advantage of this shared database is that newcomers are more quickly brought up to speed. A new member could review on-line meeting logs and e-mails to gain an understanding of what transpired before they joined the team. In addition, all team members can stay current independently. If a team member misses an on-line meeting, there will be a meeting log of the on-line conversation that any team member can review.

Disadvantages of Virtual Teams

Most of the disadvantages of virtual teams according to surveys of managers and employees involved in virtual teams centered around the perceived difficulties in managing a virtual team, communicating in a virtual team, technical problems and isolation.

Managing a Virtual Team

Managers of virtual teams were concerned with measuring performance, training and mentoring new employees, understanding what employees are working on, and communicating with virtual employees (Haywood, 1998). It is difficult to manage by walking around and manage by observation, if you are managing a virtual team. Managers of successful remote teams manage by objectives and are able to create project plans, performance standards, and reporting mechanisms that keep a virtual team on track. Managers must decide how often they need project or work feedback and general communication from virtual employees in order for them to be comfortable managing employees they rarely see.

Communication

Virtual teams do most of their communicating via computer, using e-mail and on-line meetings, and using audio-conferencing. In most cases, this form of communicating is not a perfect substitute for face-to-face contact. In our society we place a high value on non-verbal cues such as facial expressions and voice tone. When virtual team members communicate using e-mail, these visual and tonal cues can be replaced with emoticons, which do not fully convey a message's meaning. This lack of non-verbal cues and voice tone can create misunderstandings that can easily become big misunderstandings because

it is difficult to communicate your feelings and thoughts using only electronic communication channels. In addition, it takes longer to communicate this way compared to face-to-face discussions.

In virtual teams, language, culture, and style differences may be accentuated because body language and facial expressions cannot be seen. With international and multicultural virtual teams there is a difference in communication style. One manager said "As an American project manager, I was expecting that if I was proposing something stupid, I would hear it from the people on the team." In reality I had a plan with a fatal flaw, and the Japanese team members knew it, but it was not their style of communication to embarrass me by telling me. This was exaggerated because we were working virtually (Melymuka, 1997).

Isolation

Virtual team members may feel isolated and lonely as they work on their projects. They may not feel a connection and loyalty to the team that may be present if they were able to work both formally and informally in the same location. Team members are also concerned about being cut off from informal team communication. Many team members cite the fear of "out of site, out of mind."

Technology

Technology is the foundation and life support for a virtual team. In most organizations with virtual teams there is some accommodation for 24-hour support, but it may be somebody who is on-call via a page, not someone the team member would have immediate access to. Whether the team is using audio-conferencing, video-conferencing, or on-line meetings, when the technology does not work, it is very difficult and

frustrating for virtual team members to get their work done. Picture yourself in an on-line meeting having spent the last hour typing all of your communication with your teammates and during that hour you have lost network connections three times. On-line meetings take longer to begin with, add in technical difficulties and the frustration levels increase while team efficiency decreases.

Virtual Team Models

There are different versions of virtual teams. A virtual team can be a group of cross-functional experts pulled from across the organization to solve a problem or develop a project. These cross-functional teams can also include suppliers and customers. A second type of virtual team can be an intact team located in different offices or locations who work together indefinitely or who are brought together to work on a project. For example, a group of programmers located in different offices all working on the same system design. Another example would be a group of training managers from different divisions in the company collaborating on a common training project.

Lipnack and Stamp (1997) developed a model that shows the different types of virtual teams as illustrated in Table 1 on the next page. This table shows that virtual teams can be defined by their location and their organization.

Table 1: **The different types of virtual teams**

Location	Organization	
	Same Organization	**Different Organization**
Same Location	Collocated Team	Collocated Team Cross-organizational
Different Locations	Distributed Team (same organization, different locations)	Distributed Team (different organization and different locations)

In addition to location and organizational differences, there is also a continuum of how virtual teams work together. Virtual teams may work synchronously, asynchronously, or face-to-face. Groups that work synchronously interact with each other in a "real time" mode. The team members are usually distributed across multiple sites linked by various communication technologies such as the ability to audio-conference or have on-line meetings. Examples of synchronous communication are chat rooms on the internet and individual and conference telephone calls as opposed to sending e-mail or voice mail which is asynchronous communication.

With asynchronous communication, team members can log-in, read meeting notes, send e-mails, and make comments on projects at different times. Some virtual teams may meet face-to fact while other virtual teams may never see each other. Most virtual teams will use a combination of synchronous, asynchronous, and face-to-face communication in order to accomplish their team goals.

Types of Virtual Teams

There are many different types of virtual teams. Virtual teams can work on almost any type of assignment or project and all virtual teams must be able to communicate and

collaborate to get work done and/or produce a product. Mittleman and Biggs (1998) describe seven basic types of virtual teams.

Networked Teams A networked team consists of individuals who collaborate together to achieve a common goal but the membership on the team is diffuse and fluid with team members rotating off and on the team as their expertise is needed. Team members may not even be aware of all of the people involved in the network. An example of a network team could be a consulting firm that taps into its network of external experts to solve a client's problem or an organization developing technology products where team members may come on the team from around the world to provide solutions and ideas for one aspect of the project.

Parallel Teams Parallel virtual teams carry out special assignments or tasks that an organization does not want or is not equipped to perform. A parallel team has a formal membership; it is clear who is on the team. A parallel team typically works together on a short-term basis to make recommendations for organizational improvements or to solve specific business problems. An organization may use a parallel team in order to draw expertise from offices around the world to solve specific problems or make recommendations.

Project or Product Development Teams Virtual project or product development teams develop projects or products for an defined, but typically, extended period of time. Their tasks are usually non-routine, the results are specific and measurable, and the team is responsible for making decisions not just recommendations. For example, the project team that developed the Boeing 777 jet was virtual, with participation by external design firms, suppliers and vendors.

Work or Production Teams Virtual work teams and production teams perform regular and ongoing work. Such teams usually exist is one function such as accounting, marketing, research and development, etc. For example, team members in an information systems department may not see each other on a daily basis but still maintain the information system for an organization.

Service Teams Virtual service teams are distributed across distance and time. Service teams are usually set up as "follow the sun" work and are situated so that one team is working its daylight hours and there is always a team on duty.

Management Teams Virtual management teams are separated by distance and time but not by organization. The members of a virtual management team collaborate daily on various organizational problems and issues and do most of their communication using some form of technology.

Action Teams Virtual action teams offer immediate response often in an emergency situation. They cross distance and organizational boundaries and usually work together for a short period of time or during a specific situation. NASA uses action virtual teams during a mission. During a flight, mission operations, usually located in Houston, collaborates with the astronauts; with tracking stations around the globe; and with experts, such as engineers and scientists, in different locations, in order to ensure that the mission proceeds successfully.

Delimitations

This study will look at virtual team work processes, communication, and team development among groups of distance education MBA students working on a class project at a University in the Rocky Mountains.

Limitations

The class project involves conducting and analyzing a communication audit at an organization. This project is similar in nature to a project that a "real world" virtual team may be responsible for which is an advantage of this study, however the short time frame of the eight week MBA class could be a limitation of the study. Purposeful sampling was used to choose the groups; three sections out of six possible sections were chosen for study.

Significance of the Study

The number of organizations using virtual teams is growing dramatically and there is every indication that this new form of team will continue. There is anecdotal information that provides some advice to managers and organizations implementing virtual teams, but the empirical research to date has yielded conflicting results and has been conducted mainly in a laboratory setting. There is a need for more research on virtual teams in "real life" settings that can lead to a greater understanding of how virtual teams work together, develop, and communicate with each other.

George and Jessup (1997) report that researchers in the area of computer support systems have recently begun to conduct studies of groups using technology over time on common tasks. However, few of these studies use real groups in organizations, where groups work on a single task over time and where tasks have consequences. In addition, few of these studies investigate models of group development and process. This study proposes to expand on past research and fill in a research gap by looking at virtual team work processes, communication, and team development.

CHAPTER 2: LITERATURE REVIEW

Most of the research on virtual teams has involved analyzing how computer-mediated communication systems (CMCS) affect communication, group development, and decision making in virtual teams compared to co-located teams. Although not definitive, this research suggests that virtual groups communicate differently than face-to-face groups and experience team development differently than co-located teams (Chidambaram, 1996; Hightower & Sayeed, 1995; McGrath & Hollingshead, 1994). Communication research and team development research is intertwined because they are so closely related – there is a direct link between communication effectiveness and team effectiveness. Therefore, some of the research is a combination of communication and team development research. Group development is defined as the path a group takes over its life-span toward the accomplishment of its main tasks (Gersick, 1988). This section of the paper will review the research results on team development, team development in virtual teams, and communication in virtual teams.

Team Development Research

In 1956, Bennis and Shepard presented the first detailed theory of group development related to training groups. Previously, much of the work on group development had been done with therapy groups. Bennis and Shepard (1956) based their ideas on their experiences with training groups, theoretical insights of Freud (1949), Schutz (1955), and Bion (1948). In Shutz's work with groups he had noted two major orientations in groups, one toward authority and the other toward personal intimacy.

Bion had noticed that groups combine these orientations in states of "dependency," "fight-flight," and pairing (Bennis & Shepard, 1956). The central theme of Bennis and Shepard's (1956) theory of group development is that the principle obstacles to developing valid communication are found in group member's orientation to authority and intimacy. When a person joins a group they face two areas of uncertainty: they are concerned about dependence (how they will relate to authority) and interdependence (how they will work out the interpersonal relations with teammates). Bennis and Shepard proposed that groups pass through two phases, each with three subphases.

Bennis and Shepard's phases of group development.

Phase 1 – Dependence
- Subphase 1 – Submission
- Subphase 2 – Counterdependence
- Subphase 3 – Resolution

Phase 2 – Interdependence
- Subphase 4 – Enchantment
- Subphase 5 – Disenchantment
- Subphase 6 – Consensual validation

In 1965, Tuckman wrote a summary of the group development literature. Tuckman then synthesized this literature review into a model of group development that is still widely discussed. Tuckman's initial description of the developmental stages were labeled 1) testing and dependence, 2) intragroup conflict, 3) development of group cohesion, 4) emergence of solutions. The stages of task activity were labeled 1) orientation 2) emotional response to task demands 3) open exchange of relevant interpretations, and 4) emergence of solutions. Over time, Tuckman summarized the four stages as forming, storming, norming, and performing. He proposed that the stages of group development were theoretically the same for all groups. In a 1977 article that

updated the literature on group development Tuckman and Jensen left this model in place and added a final stage – adjournment. A description of each of the stages is shown below.

Forming:	Characterized by dependence, team member self-consciousness, uncertainty, orienting new members, clarify purpose
Storming:	Polarization of team members, coalitions or cliques formed, disagreement with leaders and other team members. competition among team members
Norming:	Establishing norms and expectations, establishing roles, cooperating, commitment to team goals, increased interpersonal interaction
Performing:	High trust, unconditional commitment to the team, self-sufficiency, high level of interpersonal relations among team members, supportive of each other
Adjourning:	Separation, the teamwork is terminated

Most of the proposed models of team development in the last 30 years have followed the same strategy as Tuckman's model with different labels for each of the stages. For example, define the situation, develop new skills, develop appropriate roles, carry out the work (Hare, 1976); orientation, dissatisfaction, resolution, production, termination, (LaCoursiere, 1980); generate plans, ideas, and goals; choose/agree on alternatives, goals and policies, resolve conflicts and develop norms; perform actions tasks and maintain cohesion (McGrath, 1984). Dunphy's (1968) model deviated slightly by identifying six developmental stages: maintenance of external normative standards, individual rivalry, aggression, negativism, emotional concerns, and high affection.

More recent studies by Wheelan (1990, 1994) presented the Integrated Model of Group Development. According to this model, groups exhibit five developmental stages: dependency and inclusion, counterdependency and flight, trust and structure, work, termination. According to Wheelan's research certain stages are more likely to occur

prior to others (i.e. dependency before trust); however, all groups operate in an environmental context that may affect the group development process.

Although most of the studies and articles written on group development summarize their findings with a singular list of the stages of group development, their research results parallel those of Bennis and Shephard and Tuckman and others (McGrath, 1990; Dunphy, 1968; Mann, 1967; Mills, 1964; Schutz, 1958) by viewing group development on two dimensions commonly referred to as Task Behaviors and Process Behaviors. Groups move along the task and process dimension but often at different rates of growth (Jones, 1973, 1974). The task and process dimensions are defined below (Jones, 1974).

Task Behaviors	Process Behaviors
Orientation – The team is learning what the tasks are, how the work is to be done, and what the expectations are for the team.	Dependency – The group is dependent on the designated leader for direction, assurance, protection, and structure.
Organization – The team is making choices about how it will organize the work in order to accomplish the task. Agreements are made on meeting, decision making, problem solving, leadership and conflict management.	Conflict – The group members express difficulty with one another. Differences in personality and point of view emerge. There may be internal struggle for informal leadership, influence, power, and visibility.
Open Data Flow – The team is sharing facts, feelings, opinion, intuition, or whatever other data is relevant to completing the task. People freely volunteer information and respond openly to requests for information.	Cohesion – The group openly exchanges information with one another about their feelings and their reactions to the behaviors of others.
Problem Solving – The team is efficient at sharing information and using the information to diagnose barriers to attaining goals and decision making. Tasks are being carried out efficiently and effectively.	Interdependence – The group members now recognize their need for one another in order to do the tasks for which the team is accountable. There is high level of trust and confidence in each member of the group, a high level of interpersonal support and harmonious human relations. Members can disagree with one another, but do not conflict interpersonally because they trust one another.

Gersick's (1988) study deviated from the accepted stages of group development theory to propose that teams did not develop in a universal sequence of activities or stages. Her study showed that, even though the groups being studied met over different time frames, there were similarities in the times that groups formed, maintained, and changed their approaches toward their work. Gersick proposes a punctuated equilibrium model whereby groups exhibit a distinctive approach to their project as soon as they began. They stay with the original approach through a period of inertia, which Gersick calls phase I. Phase I lasts until precisely halfway through the group's time frame. Every group then went through what Gersick called a transition. "During transition there is a concentrated burst of activity, groups dropped old patterns, re-engaged with their outside supervisors, adopted new perspectives on their work, and made dramatic progress" (p. 276). The events that occurred during the transitions created a new approach to the group's project. These new approaches carry a group through a second major phase of inertial activity that is called phase 2, as they executed the plans they had created during their transition. Groups make one last shift in their behavior patterns just before their deadlines, when they generate a final burst of activity to finish their work. This last phase is called completion.

Gersick's study seems to call for a different paradigm of group development because the group's progress was not a succession of stages, but rather groups moved ahead when and because group members felt particularly strong that it was time to move ahead.

Theories about Virtual Team Development

Most organizational researchers and authors acknowledge that teams develop in stages and most studies agree on the general outline of team process. Many authors have used the model (with some variations) of the "stages of small group development" developed by Tuckman in the 1960s: forming, storming, norming, performing, and adjourning (Tuckman, 1965). The Tuckman model has a strong theoretical base and it is supported by the experiences of many facilitators and team leaders.

Lipnack and Stamp (1997), who have written extensively about virtual teams, suggest a variation of the Tuckman model to explain team development in virtual teams. They state that there are two major stress points in a team process where stress is predictable – near the team's beginning and close to its end. The Tuckman model incorporates the first stress point (storming) but it does not address the difficulties that often arise in the later stages of a team's life cycle. They propose a five stage team process 1) start-up, 2) launch, 3) perform, 4) test, 5) deliver.

> Start-up – Start-up means gathering information, assessing the situation, finding allies, and exploring ideas. This stage may last a long time or it may be very brief.
>
> Launch – This phase involves defining the team's purpose, establishing leaders, making plans, finding resources, obtaining commitments, and acknowledging norms. Differences appear, people drop out, and other people want in. This phase usually takes longer than people think it will, and for virtual teams it can take even longer still. Some groups never leave this phase.
>
> Perform – Perform is where the team does the bulk of the work. This is where results are produced and the team begins to accomplish its goals. People find ways to overcome obstacles.
>
> Test – This is the challenge phase where the team must review its work, make final decisions, and finalize plans often with time running out. This is the second transition phase or stress point. Often this time of potential conflict is unexpected and teams struggle through this phase.

Deliver – This is the last phase, the adjourning phase. The team delivers results, provides support, finalizes projects, and ceremonializes its endings. This phase may be very brief or it can be long.

Lipnack and Stamp (1997) suggest that the more teams are knowledgeable about team process and prepared for the different stages the better they will be able to deal with the transitions that all teams experience.

Researchers have proposed theories on how computer-mediated communication and computer supported work have impacted teams in terms of group interaction and the role of relational communication on group development

McGrath (1990) uses a parallel series of stages to describe the task dynamics and social dynamics associated with a team using technology to communicate and collaborate. The four stages associated with task dynamics are as follows:

Stage 1 Inception – generating goals, defining goals, developing plans to achieve goals

Stage 2 Problem Solving – deciding how to solve problems, address issues

Stage 3 Conflict resolution – resolving conflicts

Stage 4 Execution – performing the team's work and overcoming barriers that inhibit performance

The social dynamics of a virtual team parallel the task dynamics and include four stages:

Stage 1 Interaction and inclusion – team members define their individual contributions to the teams and begin to interact with each other

Stage 2 Position status and role definition – team members interact to redefine their roles and status

Stage 3 Allocation of resources and power – the team addresses issues regarding the allocation of resources and power. This stage can be contentious.

Stage 4 Interaction and participation – this stage involves participation and interaction among team members in performing work and overcoming barriers that inhibit productivity

The team may move through the social dynamic stages in the same way that is moves through the task stages. Depending on the type of task the virtual team is working on, Duarte and Snyder (1999) suggest that a virtual team could move from stage 1 to stage 4 without going through stage 3 in both the task dynamic stages and social dynamic stages.

Another theory suggests that technology imposes certain non-changing constraints that restrict and pre-determine the outcomes of team members. This view suggests that computer-mediated group interaction, because of its lack of social cues and non-verbal communication, lacks media richness and has lower social presence than face-to face communication (Daft et al. 1987; Sproull & Kiesler, 1986). Therefore, the limited communication channels in computer-supported teamwork tend to keep the group interaction more task focused compared to traditional face to face meetings (Hiltz, et al., 1986).

Based on this theoretical perspective and research studies, there are two key propositions about virtual team development:

1. Computer supported teams need more time to develop close relations compared to face-to-face teams. Because there is limited time to accomplish tasks and the fact that communication takes longer (typing vs. talking) less social communication is exchanged in computer-mediated environments than in face-to-face interactions (Walther et al., 1994).

2. Over time, team members using computers to communicate will adapt the communication medium (computer) to meet their relational needs.

The social information-processing perspective (SIP) supports the second proposition in explaining relational communication development in virtual groups. This

perspective acknowledges that people spend less time communicating when using computers to communicate, so the relational communication that supports developing relationships is decreased. However, if the team works together over an extended time it will enable team members to develop interpersonal knowledge and stable relations. Because virtual teams take longer to communicate than face-to-face teams, virtual teams and face-to-face teams may operate at different rates when exchanging social oriented communication. Thus, the depersonalizing effects of computer communication may be limited to initial team interactions, especially among team members who do not know each other (Walther, 1992).

Thus, SIP proposes that the restrictiveness of the computer medium, while hindering relational intimacy initially among team members who do not know each other, will decrease over time. In fact, the theory predicts that repeated interactions via the computer will lead to the exchange of enough interpersonal communication that can eventually encourage the development of strong, stable team relations. In summary, SIP suggests that the on-going use of computer communication even with all of its restrictions, is not likely to impede relational development in groups (Chidambaram, 1996).

McGrath's TIP theory (Time-Interaction-Performance) offers another means for understanding the development of relational links in groups (McGrath, 1990). According to TIP theory, groups perform three functions: 1) production, 2) member support, and 3) group well-being. The functions are achieved by carrying out activities in one of four modes:

Mode I: Activities related to choosing goals and objectives

Mode II: Activities related to solutions of technical issues with regard to how to achieve the group's goals.

Mode III: Activities related to conflict resolution.

Mode IV: Activities related to execution of the requirements of the group's task

Developing relational links in a team involves performing activities related to the member support and group well-being functions. These activities would include things such as establishing position or group status of members, defining task roles of group members, and establishing norms for group interaction. Relational development activities are most common after a group has a significant transition such as when beginning to work together or having a new person join the team. Established groups spend less time on relational-oriented activities and more time on task-oriented activities, and therefore should be more efficient in accomplishing tasks.

Burke and Chidambaram (1995) used an inputs-process-outputs perspective to examine group interactions for virtual teams and co-located teams. According to this model, differences in various characteristics of the meeting mode (inputs) coupled with the influence of boundary variables such as duration of the interaction (time) will result in corresponding differences in the way meeting participants behave and perceive the interactions (processes). Differences in processes and perceptions will determine the performance of groups along a variety of measures (outputs). The model is illustrated in figure 1 on p. 29.

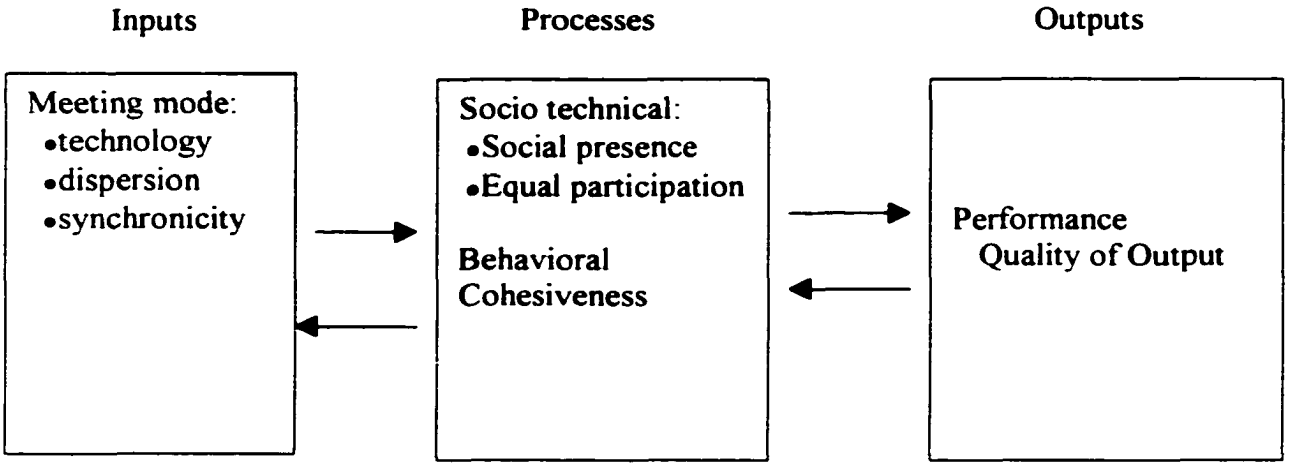

Figure 1: Research Framework for Group Interactions

Research on Virtual Team Development

Research on virtual team development has focused on comparing virtual teams and co-located team development, effectiveness, comparing virtual team and co-located team group development in terms of collaborative climates, coordination, cohesion, and trust in virtual teams.

Bordia and colleagues (1999) studied developmental patterns in 14 informal groups on computer mediated networks. The results of this study showed that these groups showed similar developmental patterns to face-to-face groups. The researchers state that their results show developmental patterns that are similar to the developmental patterns found by Wheelan (1990, 1994).

Kutsko and Smith (1991) surveyed team members of a real organization on their perceptions of team interaction and effectiveness between virtual and co-located teams. Interestingly, the virtual teams indicated a more positive perception of the collaborative climate of their team. Facets comprising a collaborative climate included trust in each other, perceived competence, and shared values. Virtual groups also perceived the

structure to facilitate more effective information exchange and interaction and they exhibited greater feelings of goal directness than the co-located teams.

Burke and Chidambaram (1995) conducted a longitudinal study comparing the developmental patterns of groups in three types of electronically supported meeting modes: face-to-face, virtual-asynchronous, and virtual-synchronous. The study compared the three meeting modes on several behavioral and souci-technical dimensions that influence the group development process. Their findings showed that face-to-face groups tended to exhibit more effective leadership and coordination competence over time as compared to the virtual groups. However, along several other group process dimensions such as cohesiveness and equality of participation, virtual groups did not differ from their face-to-face counterparts. In addition, groups in all three modes performed equally well in terms of the quality of outputs. The authors suggest that these results indicate that virtual teams that receive adequate time and training can become cohesive and perform effectively in the long run.

Research on Virtual Team Trust

Trust is critical in new organizational arrangements where the traditional social controls based on authority give way to self-direction and self-control (Miles & Snow, 1992). Handy (1995) asserts that if the efficiencies and benefits of the virtual organization are to be realized, that the virtual organization and its members will have to rediscover how to run organizations based more on trust than on control.

Trust is reported to reduce transaction costs, (Cummings & Bomiley, 1996; Handy, 1995), increase confidence and security in relationships, and promote open and complete information exchange (Earley, 1986). Although trust is critical in any team,

trust is pivotal in "preventing geographical distance from leading to psychological distance in a global team," (Snow et al, 1996). O'hara-Devereaux and Johansen (1994, pp 243-244) state that "trust is the glue of the global workspace and technology doesn't do much to create relationships."

Jarvenpaa et al (1998) conducted a study to examine the antecedents of trust in a global virtual team setting. Team trust was most strongly predicted by perceptions of other team members' integrity and weakest by perceptions of their benevolence.

A qualitative analysis of the three teams that displayed the highest level of trust and the three teams that displayed the lowest level of trust led the researchers to identify strategies that were used by the high trusting teams. The strategies common to high trust teams (and less common or non-existent in low trust teams) were: proactive action, task versus procedural orientation, positive tone, rotating leadership, task goal clarity, role division, time management, nature of feedback and frequent, sometimes intense bursts of interaction.

Communication Research

McGrath and Hollingshead (1994) systematically reviewed published empirical studies assessing the impact of computer-mediated interaction on how groups work. This is directly related to virtual groups, as most virtual groups use computers to interact. The empirical studies they reviewed fit into three categories:

1) Studies of groups with different communication media for a single group. Most of these studies were done in a laboratory setting, using ad hoc groups to compare computer-supported groups with face-to-face groups.

2) Studies of groups with different communications media for a series of meetings. Most of these studies also compared computer-supported groups with face-to-face groups.

3) Studies of groups using different communications media throughout an extended time period. These studies investigated computer groups versus other media (phone, mail).

Using the research strategies listed above, the research on communication within virtual teams or teams using computer-mediated communication systems has focused on communication effectiveness, socioemotional or relational communication, the amount of communication, and equality of communication. A review of this literature shows that, so far, there is inconsistency in the research results. This section of the paper will review the results of these studies.

Impact of Computer Communication on Virtual Teams

Computer-mediated communication systems (CMCS) are sociotechnical systems that support and enhance the communication-related activities of team members engaged in computer-supported cooperative work, such as virtual teams (Warkentin, Sayeed, & Hightower, 1997). The teams can communicate synchronously and/or asynchronously; they may be located together or remotely. One objective of using these technologies is to create comparable levels of communication speed and effectiveness as those achieved at traditional meetings (Warkentin et al., 1997).

CMCS imposes constraints on communication that are likely to affect a group's performance. Face-to-face team interaction relies on many forms of communication such a paraverbal (tone of voice, inflection, voice volume) and nonverbal (eye movement, facial expression, hand gestures, and other body language) cues. These cues help to control the flow of conversation, facilitate turn taking, provide feedback, and convey subtle meanings. When using CMCS these paraverbal and non-verbal cues are absent

which alters the orderliness and effectiveness of information exchange (Hightower et al. 1997).

Virtual teams are not able to duplicate the normal "give and take" of face-to-face discussion and the lack of nonverbal and paraverbal cues also reduces the richness of information transmitted by virtual team members. A rich medium is one that conveys multiple verbal and non-verbal cues, allows for immediate feedback, uses natural language, and allows personal focus. Daft and Lengel (1986) define media richness as "the ability of information to change understanding within a time interval" (p. 560). Rich information provides redundant cues, via nonverbal and paraverbal channels, that reduce uncertainty by helping people to interpret the messages they are receiving. Daft and Lengel (1986) created a hierarchy of medium richness, with face-to-face communication at the top, followed by telephone, electronic mail, and print communications. According to this hierarchy, CMCS would qualify as a lean communication channel. Therefore, when using a lean communication medium, such as CMCS, it takes more time and effort by group members to achieve the same level of mutual understanding.

The impact of reduced communication richness on team performance may depend on the type of task in which the group is engaged (Hollingshead, McGrath, & O'Connor, 1993). Daft and colleagues argue that the effectiveness of a communication medium for a given task depends on the degree to which there is a fit between the richness of information that can be transmitted via the technology and the information richness requirements.

For example, tasks requiring groups to generate ideas (simple brainstorming) may only require transmitting specific ideas. On the other hand, tasks requiring groups to

negotiate or resolve conflicts may require the transmission of very rich information including not only "facts" but values, attitudes, emotions, expectations, and commitments. So, information richness becomes increasingly important for effective task performance as the group's task makes reaching consensus more difficult, therefore requiring that richer information be communicated (Straus, 1992).

A study by Hollingshead et al (1993) explored the effects of computer-mediated communication and task type on group task performance. In this study, face to face groups performed better on intellective and negotiation tasks than virtual groups performed. However, there were no differences in task performance between face-to-face and virtual groups on generating and decision-making tasks. It should be noted that a second aspect of the study was to look at the relationship between technology, task performance, and experience with the technology. The results also showed that the relationship between technology and task performance appeared to be more dependent on experience with the technology and with group membership than on the type of task on which the group was working. This study would seem to indicate that an important contributor to virtual team effectiveness is that all team members know how to use the technology and are comfortable using the technology.

Communication Effectiveness

Much of the virtual team research suggests that groups using computer mediated communication systems (CMCS) communicate less effectively in many circumstances than groups meeting face-to-face (Warkentin et al., 1997; Hightower & Sayeed, 1995,1996). However, many of these studies focused on ad hoc groups and/or gave the groups limited time to adapt to one another and the communication medium. Recent

studies suggest that when virtual teams are given sufficient time to develop strong intragroup relationships and to learn to use the communication medium they may communicate as effectively as face-to-face groups (Chidambaram, 1996; Walther, 1992).

Relational Communication

There have been several studies that investigated the effect of communicating via CMCS on the ability of a virtual group to develop relationships within the group. These studies have had contradictory results with some studies showing that virtual groups do not develop relationships as well as co-located teams and other studies showing that virtual groups develop better relationships than co-located teams.

Hiltz, et al (1986) compared face-to-face and virtual work groups for differences in communication content, emotionality, participation, and decision quality. Bales et al (1951) IPA coding scheme was employed for content analysis and showed virtual groups express less communication and less agreement than face-to-face groups. In general, there was more socio-emotional exchange in face-to-face groups and more task-related exchange in computer-mediated or virtual settings.

Chidambaram's (1996) study of virtual teams also showed that virtual teams tend to be more task oriented and exchange less socioemotional information, because exchanging information using CMCS is more difficult. This lack of socioemotional information slows the development of relational links in virtual teams (Chidambaram, 1996). These results were confirmed in a study conducted by McGrath and Berdahl (1998) which found that student groups using CMCS had higher levels of task activity and lower levels of social activity than teams working in a face-to-face environment.

A Warkentin et al (1997) study comparing virtual teams and co-located teams provides several insights into the communication process of virtual groups. This study found that the strength of relational links within the groups is positively associated with the effectiveness of information exchange within the group. Therefore, the more effective the group is at communicating, the stronger the relational links are between group members. So, this study found that while there are many advantages to using virtual teams, virtual teams may hinder the development of a strong sense of cohesion and satisfaction with the group's interaction process, if the communication processes are not effective. The Warkentin study also found that face-to-face groups reported a higher degree of cohesion and were more satisfied with the team's outcome.

Walther (1992) assessed relational communication in 32 groups using either face-to-face or asynchronous electronically supported meetings over a period of time. Surprisingly, groups using CMCS to communicate reported higher perceptions of immediacy/affection than face-to-face groups. Although, the immediacy /affection decreased over time in both types of groups. Walther also found informality (a measure of relational closeness) was higher in computer-supported than face-to-face groups. This result was not the result that the researcher had predicted. A final result of this study was that the CMCS groups exhibited higher levels of social communication than task communication when compared to face-to-face groups. Thus, generally, CMCS groups perceived their interactions as more personal than the face-to-face groups. These results run counter to what theories have predicted and other studies have reported regarding communication in CMCS groups and highlight the contradictory results in this area and the need for more research.

Walther and Burgoon (1992) researched the effects of time and communication channel - asynchronous computer conferencing versus face-to-face meetings on relational communication in groups. Based on this study they propose that while communicating by computer does reduce social interaction among teams, these teams will eventually develop ways of exchanging more social oriented communication. At the least, computer communication did not impede the feeling of some relational development over time. These researchers argue that virtual teams take longer to exchange social communication, but given adequate time they will reach the same relational level as face-to-face groups. Developing these relational links is important for teams because researchers associate strong relational links with positive team outcomes including enhanced creativity and motivation, increased morale, and better decisions in groups (Walther & Burgoon, 1992).

This finding would support the recommendation to use some traditional meetings that allow virtual team members to meet each other in person and get to know each other at the beginning of a project. If a group is unable to meet at the beginning of a project, it may be help them find other avenues for building relationships.

Amount of Communication - Face-to-face/ Virtual Teams

Some of the studies on CMCS and virtual teams have looked at the amount of communication in face-to-face groups compared to virtual groups. In studies where virtual groups had unlimited time, the number of messages they exchanged was no different than in face-to-face groups (Dubrovsky, Kiesler, & Sethna, 1991; Weisband, 1989). Field studies in which user interaction time is not limited have found more socially oriented communication in virtual groups than has laboratory research on communication in virtual groups. Studies have also found that there was no significant

difference in the amount of unique information the two types of teams exchanged (Dubrovsky et al, 1991).

Equality of Participation

Early research on communication in virtual teams suggested that virtual teams demonstrate greater equality of participation within the team than co-located teams. Virtual teams offer group members anonymity (Jessup et al, 1990) and prevent conveyance of group member status. These factors help to "level the playing field," sometimes leading to increased equality of participation (Siegel et al, 1986). A more recent study by Burke and Chidambaram (1995) found no support for this position. Although, it should be noted that the Burke and Chidambaram study measured group members' perceptions of participation, not objectively evaluating each member's participation. They took this approach because group members' perceptions are an important aspect of group development.

Based on the published research on communication in virtual teams it appears that contradictory results are common and that more research needs to be done before we understand the impact of communicating in a virtual environment. In addition to doing more research, the research should move out of the laboratory to studying "real life" virtual teams.

Summary

The research done to date on virtual teams gives us some insight into how they communicate and work together. However, the conflicting results from many of the studies preclude us from drawing any conclusions about how virtual teams work. There is anecdotal evidence based on individual organizations and managers' experiences with

virtual teams that provide some advice to organizations and managers seeking to implement and/ or improve on how they manage virtual teams.

While more people are researching and writing about virtual teams, most of the research is focused on the impact of technology on how groups do work. These studies on the impact of technology may be applicable to virtual teams, depending on the research strategy. In general the empirical literature assessing the different aspects of technology and virtual teams is limited and relatively scattered. Much of the research is static; it involves ad-hoc groups using computer systems for a single or limited number of sessions often for the first time, as compared with face to face groups who have been communicating in groups all their lives (Hollingshead et al, 1993). While there is a plethora of research describing various technologies for computer mediated communications, there is a lack of studies examining sustained, project oriented teamwork of the sort that is important in most real-world organization (Galegher & Kraut, 1994).

CHAPTER 3: METHODOLOGY

The purpose of this study is to understand the work processes, communication, and group development process of virtual teams. Virtual teams have geographically dispersed members who work apart more than in the same location. They solve problems together, make joint decisions, and usually have less than 20 team members. The specific research questions that this study seeks to answer are:

1. How do virtual teams work together?
2. What is the mix of task vs. process communication on virtual teams?
3. Do virtual teams go through the same stages of team development as co-located teams?
4. Is there another model of team development that better fits virtual teams?

Seven virtual teams were studied using a qualitative grounded theory approach to analyze and understand the work processes, communication, and team development process for virtual teams. Understanding how virtual teams work together and the team development process for virtual will help managers of virtual teams and people working on virtual teams to improve the effectiveness of virtual teams. This chapter discusses the research approach used in the study, the research process, the data sources, the data analysis, the issue of trustworthiness, and the researcher's point of view.

Research Approach and Rational

This study followed the tradition of group dynamics research in its qualitative analysis approach. A qualitative research design, using grounded theory, was used. In qualitative methodology, inductive logic is used to analyze context bound information

leading to patterns or theories that help explain a phenomenon (Creswell, 1994). Morse (1990) defines the characteristics of a qualitative research problem as

1) the concept is "immature" due to a lack of theory and previous research

2) a notion that the available theory may be inaccurate, incorrect, or biased

3) a need exists to explore and describe the phenomenon and to develop theory

4) the nature of the phenomenon may not be suited to quantitative measures

The research questions for this study, how do virtual teams work together, communicate, and develop, fits the criteria listed by Creswell. Virtual teams, as a research field, is fairly new because virtual teams themselves are a new form of teamwork. There has been minimal research on work processes and team development in virtual teams and while some theories about virtual team development have been proposed, none have been empirically tested. In order to develop a team development theory for virtual teams, there is a need to explore and describe the work processes and developmental process of virtual teams. To develop this theory one needs to begin with an inductive process that seeks to describe the team development process.

Grounded theory is a mode of data analysis used to better understand social phenomena. It is especially designed for generating and testing theory (Strauss, 1987). In grounded theory, researchers attempt to derive a theory using multiple stages of data collection.

> A grounded theory is one that is inductively derived from the study of the phenomenon it represents. That is it is discovered, developed, and provisionally verified through systematic data collection and analysis of data pertaining to that phenomenon. One does not begin with a theory, then prove it. Rather, one begins with an area of study and what is relevant to that area is allowed to emerge. Grounded theories, because they are drawn from data, are likely to offer insight, enhance understanding, and provide a meaningful guide to action (Strauss and Corbin, 1998, p. 12).

The goal of grounded theory is three fold: a) discovery, b) conceptualizing the world under investigation, and c) generating a theory or paradigm about that particular world (Hutchison, 1988). This study seeks to discover or understand the team work processes, communication, and development process for virtual teams. The study will analyze the data so concepts about team work processes and developmental processes are formed and can be used to generate a theory about virtual team development.

Data collection procedures in qualitative research involve observations, interviews, documents, and visual images. For this study, the team processes were "observed" by analyzing their on-line meetings (synchronous interaction). Essentially, this involved analyzing the transcripts of the team's on-line meetings.

Research Process

The research process involves selecting participants, or virtual teams, to study, collecting data, and strategies for analyzing the data.

Participants (population, sample, sampling design)

The research project studied multiple teams with the hope of increasing the understanding and explanations of virtual team development. Using multiple teams can help the researcher build a knowledge base by examining similarities and differences across cases. The research project studied seven virtual teams of MBA students who worked in a virtual environment to complete a class project. The graduate students were located throughout the United States and were enrolled in the Distance MBA program at a University located in the Rocky Mountains. The class project involved administering, analyzing, and writing the results of a communication audit.

In concert with the concept of purposeful sampling, (Patton, 1990; Strauss and Corbin, 1998) information rich cases were sought for the study. The teams were chosen from three sections of a managerial communications class. Criteria for choosing the teams included teams that had the most chats (therefore, providing the most data for analysis) and teams that had all members agree to participate in the study. In addition, an effort was made to choose teams that had different levels of knowledge of each other. In one team, everyone had worked together on a previous class project, in another team some of the team members had worked together previously, while some were new team members and in the other four teams, individuals did not know each other. Six of the teams used synchronous communication (on-line chats) to complete 80 percent of their work and one team used synchronous communication to complete 50 percent of their work and asynchronous communication to complete 50 percent of their work.

Data Collection

All students in the three sections were sent a description of the study toward the end of the eight-week class and asked to participate in the study. Students indicated their willingness to participate by returning the required Human Subjects form to the researcher. One of the assignments in the class was to work as a virtual team to complete as class project. As part of this assignment, students were required to have weekly on-line meetings to work on the project. The students were asked to save the on-line chats so the professor could review them to determine a class participation grade. At the end of the semester, the researcher saved the on-line chats as text files, downloaded the files, and analyzed the on-line meetings, or chats, to look for information about team processes and development.

Data Analysis

Grounded theory uses a process of constant comparative analysis with three levels of codes that guide the researcher in analyzing the data and developing theoretical constructs. The coding process involves open, axial, and selective coding.

Open coding provides a procedure for developing initial categories of information and identifying concepts in the data (Strauss and Corbin, 1998). "During open coding, data are broken into discrete parts, closely examined, and compared for similarities and differences," (Strauss and Corbin, 1998, p. 102). By closely examining the data for both similarities and differences, the researcher can finely discriminate between different categories of data. The unit of analysis for this study was a complete thought or speech segment. According to Wheelan (1990, 1994) a complete thought provides enough information so that it can by interpreted by others. Similarly, Henri and Rigault (1996) define a speech segment as the smallest unit of delivery that is linked to a single theme. In this study, each line of on-line conversation was open coded analyzing the whole line or phrases and words within the lines according to the definition given by, Henri and Rigault (1996).

Next, axial coding was used to find relationships among the categories of open codes. The purpose of axial coding is to begin the process of reassembling data that were segmented during open coding. In axial coding, the categories are related to each other to form more precise explanations about the phenomena being studied. During axial coding the researcher is looking for cues in the open codes from the data that show how major categories might relate to each other (Strauss, 1987).

Last, the researcher seeks to integrate the information and define the theory using selective coding. To begin integrating the categories and developing a theory, Strauss and Corbin (1998) suggest that the researcher discover the central or core category. Hutchison (1989) also discusses the importance of finding what is called a core variable. The central category or core variable(s) help the main themes of the research project to emerge and explains what is really going on in the data. A central category has three characteristics: 1) it recurs frequently in the data 2) it links the data together 3) it helps explain the variation found in the data. The determined core categories become instrumental in generating a theory because all of the categories and patterns found by coding the data will eventually relate to the core variables.

From the core categories or themes, the researcher develops a conceptual framework that illustrates and supports the grounded theory. A good theory, according to Glaser (1978), is one whose categories fit the data; that is relevant to the core of what is going on; that can be used to explain, predict, and interpret what is going on; and that is modifiable.

Within the context of this study the researcher performed open coding on each chat for each team. Next, the researcher looked for axial codes for each chat for the team. This process was followed for each subsequent team. So, the first analysis done in this study was a within case analysis. The first team's chats were coded and then entered into a matrix that displayed the open codes for each page of a team's chat. Next, the axial codes were entered into a matrix that displayed the themes and researcher observations for each chat. After each team had been reviewed as a within case analysis, a cross case analysis was done.

The purpose of cross-case analysis is to increase generalizability: it allows the researcher to determine if the findings from one case make sense across multiple cases. Cross-case analysis also provides a deeper understanding and explanation of the phenomenon being studied. By studying similarities and differences across cases researchers are able to strengthen their theory development (Miles and Huberman, 1994).

To conduct the cross case analysis the information from the axial codes were displayed in a time ordered Cross-Case Meta Matrix (Miles and Huberman, 1994), shown in table 2 , below. The researcher then analyzed the data by looking for themes and central categories across cases and began the process of building theory.

Table 2 Time Ordered Meta-Matrix

Team	Chat 1	Chat 2	Chat 3	Chat 4
Team 1	*Key categories from axial coding*			
Team 2				
Team 3				
Team 4				
Team 5				
Themes	*common themes across teams for chat 1*			

One aspect of the cross-case analysis was to look at each team's chat in sequential order, i.e. review all of the first chats for each team and determine similarities and differences between each team. A table was then developed that displayed the similarities, differences, and common themes for each chat.

The first analysis conducted on the team's chats looked for common themes that explained how the virtual teams worked together. After analyzing the cross-case meta matrix the researcher developed six common themes that explain how these virtual teams worked together.

In addition to coding the chats to build theory, the researcher also coded the chats deductively according to whether the words being "spoken" had a task focused content or social focused content. Task content refers to the actual work to be done. Task behaviors are behaviors specifically designed to help the team accomplish the task goals of the team. The social communication on a team is the team's desire to work well as a team, to maintain itself as a team. Social communication is often aimed at creating a good social environment in which team members can work. Social communication may involve get to know you discussions, humor, and other communication focussed on building relationships.

For each chat, the total number of words in the chat were counted, the total number of social words were counted and the percentage of task focused content and social focused content was calculated. The end result is a comparison of task communication and social communication for each chat for each team.

The last analysis done involved looking for patterns in the data to provide an explanation of how virtual teams develop. Both within case analysis and cross case analysis was done to analyze the team development process for each team. The researcher began by using deductive codes obtained from the literature on the stages of team development. The deductive codes for the stages of task development are

orientation, organization, open data flow, and problem solving. These stages are explained below.

Stages of task development

Orientation

1. The task activity is centered around the leader
2. The group's expectations are unclear
3. The group has not set goals
4. The responsibilities of group members are unclear
5. The group is unsure about the task

Organization

1. The group's strategy for completing the task is unclear
2. The group is establishing criteria for evaluating performance
3. The roles in the group are being negotiated
4. The group is determining how it will work together
5. The group is beginning to prioritize its tasks

Open Data Flow

1. The group is open and honest in its communication – no hidden agendas
2. The group is developing task adaptability
3. Team members spontaneously critique the functioning of the group
4. There is an easy flow of discussion
5. There is open sharing of information

Problem Solving

1. The group is effective in identifying barriers to accomplishing its task.
2. The group generates creative solutions to problems
3. The group is becoming effective in diagnosing and improving the team's task functioning.
4. The group is able to consider options in how to accomplish its tasks
5. The group engages in effective "team" problem solving

Next, the researcher applied deductive codes from the teamwork literature to the process stages of team development. The process stages of team development are dependency, conflict, cohesion, interdependence. The explanation for each of these stages is listed below.

Dependency

1. The group members are asking for direction.
2. Group members do not express their feelings.
3. Group members are cautious with each other.
4. Group members do not seem to trust each other

Conflict

1. Group members resist being led.
2. Group members seem to be in a leadership or power struggle.
3. Group members are beginning to learn how to get along with each other.
4. There is significant interpersonal conflict.
5. There is open disagreement about the group's goals.

Cohesion

1. The group's relationships with each other tend to be harmonious
2. There is a clear sense of "we" in this group.
3. There is interpersonal trust
4. Group members stand up for each other.
5. The group is becoming a cohesive team.

Interdependence

1. Group members are willing to risk expressing new ideas.
2. The group is capable of honest and straightforward confrontation.
3. Appropriate leadership emerges from the group spontaneously.
4. Group members are able to disagree with each other without taking it personally.

The deductive codes used for the task stages of team development seemed to fit the virtual teams used in this study. The researcher was able to see evidence of orientation, organization, open data flow, and problem solving behavior in the chats. The coding for the process stages of team development, however, did not go as smoothly. The researcher did not see evidence of dependency behaviors or conflict behaviors in the virtual teams. To address this issue the researcher established two new codes to identify the stages of process development for virtual teams. These new codes better fit the behavior at the beginning stages of the virtual teams. These two new codes were

introduction and collaboration. discussing how to accomplish this project in a virtual environment, and sharing some information about their jobs. Group members are usually somewhat cautious and do not openly express their opinions or ideas. Collaboration is characterized by open, easy conversation, using the group decision making process, people volunteering or asking others to volunteer, people expressing appreciation and thank-yous to each other, asking for each other's input and an open exchange of ideas.

So, the codes used to analyze the process stages of team behavior were introduction, collaboration, cohesion, and interdependency.

Figure 2, below, shows the overall research process used for this study.

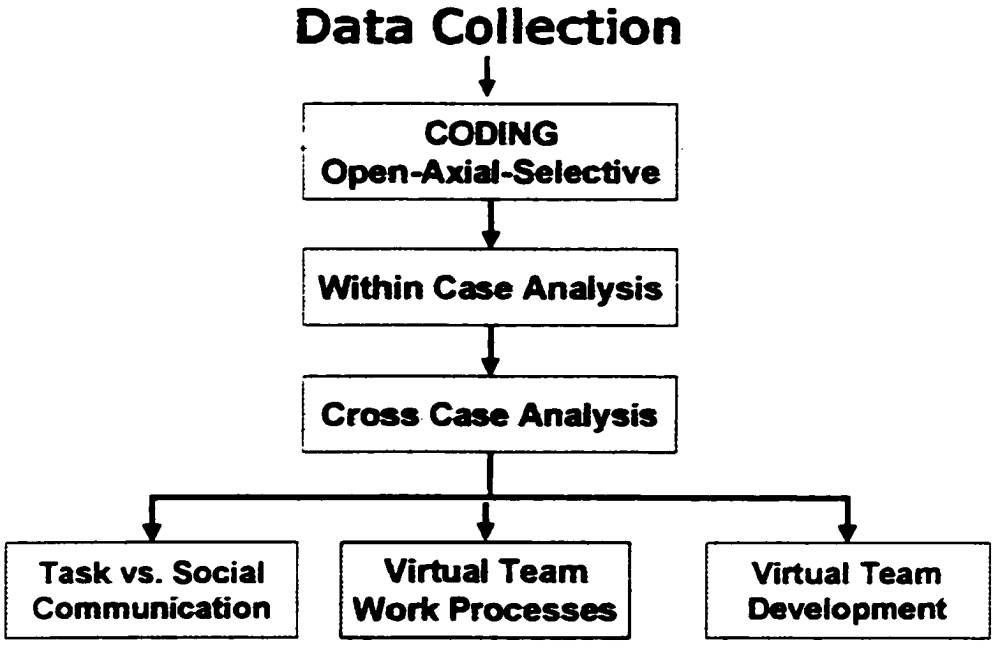

Figure 2. Research Process for Dissertation

Trustworthiness

To increase trustworthiness in this qualitative study the researcher used an emergent design in the initial analysis and avoided imposing constraints on the data gathered. To ensure this trustworthiness the researcher did the following: 1) maintained a position of empathic neutrality; the researcher is not beginning this study with preconceived ideas about what the team work and team development process for virtual teams might be; 2) verified the coding process with another experienced qualitative researcher to obtain a peer review; 3) maintained an audit trail and kept notes on the analysis being done and the decisions that were made about the analysis process and findings; 4) used memoing to help track the researcher's objectivity.

By using seven teams for this study the researcher obtained information from a diversity of data sources. The participants are from varied disciplines, industries, and geographical areas, which should increase the transferability of the study.

Researcher Perspective

The researcher is familiar with the team develop process and has a history of interest in teams as well as experience in conducting team development programs for different organizations. The researcher is familiar with the team development literature and the virtual team literature that has provided knowledge on the team development issue and some sensitivity on the issue. The researcher is familiar with the team development theories for co-located teams and even though this is an emergent design the researcher will need to be very careful to not try to fit the data to an existing theory about team development.

CHAPTER 4: RESULTS

The purpose of this study was to analyze the teamwork processes, communication, and team development processes for virtual teams. Seven virtual teams of MBA students completing a communication audit as a class project were studied. The team's on-line synchronous chats or meetings were analyzed using a qualitative, grounded theory approach to the research.

The specific research questions are:

1. How do virtual teams work together?
2. What is the mix of task vs. social communication on virtual teams?
3. Do virtual teams go through the same stages of team development as co-located teams?
4. Is there another model of team development that better fits virtual teams?

The chats were first coded using open, axial, and selective coding on each team. Then a cross team analysis was completed and theories about work processes and team development were developed. In addition, the task and social communication was analyzed.

The results of this study will be presented in the following order. First the virtual team environment and the virtual teams involved in this study will be described. Next, the results of the virtual team work processes analysis will be discussed; then the analysis of the communication processes will be presented. Last, the team development processes will be discussed.

Description of Virtual Team Environment and Virtual Teams

The unique features of the virtual team work environment and a description of the virtual teams that participated in this study will be discussed in this section.

Virtual Work Environment

Six of the seven teams in this study conducted 80 percent of their work using synchronous communication and 20 percent of their work using asynchronous communication (email). The seventh team completed 50 percent of its work synchronously and 50 percent of its work asynchronously. The synchronous communication was conducted using on-line chats or team meetings. The chats were conducted using a version of First Class software that had chat and email capabilities within the team's assigned folder. The team also had a team conference where they could post messages to each other.

When participating in an on-line chat, the communication occurs as people type in their comments. As they type, their name shows up on all team member's computer screens along with their comments. These synchronous meetings can often become a convoluted series of communications between team members because comments can seem out of context, or the conversation may lack focus because multiple people are "talking" at once. For example, as team member A is typing their response to a previous comment, another team member changes the subject or asks another question. So, team member A's comment appears out of context due to the delay in response caused by typing comments instead of speaking. Team members must learn to be patient with this form of communication and find ways to structure the "conversations" so the confusion does not become overwhelming.

Another aspect of synchronous communication is the lack of nonverbal and parabverbal cues which reduces the richness of the message being transmitted. Some of the virtual teams began to use emoticons and shorthand acronyms to communicate the nonverbal and paraverbal cues. These include communications such as "thinking....," "sigh of relief," and LOL (laughing out loud).

Virtual Teams

Seven virtual teams comprised of five to six people on each team participated in this study. The demographics for the 237 students enrolled in distance education classes during the Spring 1999 semester show that 24 percent of the students were female and 76 percent were male. The average age of the students was 37 with ages ranging from 24 to 56. Of the 78 percent of the students reporting their ethnicity, 70 percent are white, 4 percent are Black, 3 percent are Hispanic, 1 percent are Asian/Pacific Islander, and 1/2 percent are Indian. The students came from forty-five different states in the United States and several foreign countries.

Team 1

Team 1 had five members who had not worked together before, and, therefore, did not know each other before this class. For some team members this was their first experience in the distance education graduate program. There was some initial "get to know you" communication and they exchanged phone numbers and where they worked, then they became very task focused. One team member, in particular was very task focused in the first few chats. When he did not assume this role, there was a lot more confusion in the team and time wasted on figuring out what to do. There was no team leader assigned. Often they did not have agendas for meetings and even when they did

they did not follow the agenda. The team did not have an expectation that everyone would attend every chat. The team members were very willing to volunteer to do particular tasks and they did not seem to get frustrated at the confusion and need to repeat information during chats. The team had 10 chats over seven weeks. The team ended their project on a positive note with many comments about this being a good team to work with.

Team 2

Team 2 had six members, some of whom appeared to know each other from previous classes, but they had not worked together on a team before. The group had some personal "get to know you" conversation and humor in first chat. The team used the decision making process in the first chat (used eventually by all other teams). They seemed to be very supportive of each other from the beginning. The were many comments thanking other team members for their ideas and work and complimenting people on their suggestions. This group used more emoticons and used them earlier in the semester than other teams. The group also experienced some confusing and frustrating chats and there were times when team members were not keeping up with what needed to be done next. The team ended their last chat with many positive comments about working together again in another class. The team had 10 chats over eight weeks.

Team 3

Team 3 had six members, who knew each other from other classes and had all worked together on other projects. This group seemed very comfortable with each other, honestly exchanged opinions about classes and displayed much humor and gentle teasing

in the first chat. This group also had some confusing conversations due to the nature of the on-line format and they communicated their frustration to each other. This group communicated a lot more non-verbals during chats – such as "thinking..." and taking a deep breath "ahhhhhhh". The group communicated more personal information earlier in the semester than any other team. Group members worked to ensure everyone was included in the discussions, expressed genuine concern over the equal distribution of workload, and provided very honest feedback on each other's writing. The last team chat contained lots of humor and examples of "silly" humor" one might see in a meeting when people have been working too hard for too long. The team had 7 chats over six weeks.

Team 4

Team 4 had five members who had not worked together before and did not know each other. This team had a later start on the project (first chat on February 15) and in the first three chats they did not have everyone present. One person took the lead and really guided the project and did the majority of the work in getting the project started and completed. One team member never attended a chat although she did write-up one section of the report. During chat 5 the amount of social communication began to increase and the tone of the chats became friendlier. Although, overall, there was very little humor and social "get to know you" communication compared to the other teams. The team had shorter chats and fewer chats than other teams - 6 chats over five weeks.

Team 5

Team 5 had five members. Some members on this team have chatted before in other classes and two of them may have worked together on another project. This is the only group to ask the question "who wants to be team leader" although, it was never

followed up on and no team leader was officially chosen. One person, however, did take the lead and do a lot of the work. The team chats contained comments on the team process early in the semester and the team complimented each other often on the "good job" they were doing. The team members were quick to volunteer for different aspects of the project. It was a congenial group and they ensured that everyone had a chance to participate in the chats. The team had 9 chats over five weeks.

Team 6

Team 5 had five members. The team members did not know each other before being assigned to the communication audit project. This team conducted 50 percent its work through on-line chats and 50 percent of its work using email. For the first three chats all team members were not there. The team members that were there were hesitant to make decisions without everyone's input. There seemed to be some frustration because people were not attending chats, but this was not openly addressed. At the end, one person did most of the work pulling the report together and writing the report. This is a different approach than the other teams used. The last chat ended with a lot of social communication, but there it did not contain the personal good-byes often seen in other teams. The team had 7 chats over six weeks.

Team 7

Team 7 had five team members who had not worked together before. The team agreed on a company to audit in the first chat and their chats were characterized by easy conversation and more humor and social communication from the beginning, compared to the other teams. A team member commented during their second chat that "it is hard to believe we are a new team" (because things were going so smoothly). The team

members easily volunteered for tasks that needed to be done and thanked each other for their contribution. The group did experience some confusing conversations during chats and they expressed their frustration (mostly with the communication medium) and the difficulty in making group decisions in a virtual environment. One person seemed to initiate most of the social communication in the group and the amount of social communication did increase the more the group worked together. At the end of the semester there were no good-byes or "nice working with you" comments, although, they did celebrate (in writing) "we did it!!!!!

The following table summarizes some key information about each of the groups.

Table 3 Description of Virtual

Team	New Group	Number /People	Number/ Chats	Percent of work done Synch	Length of Time	Grade
Team 1	yes	5	10	80	7 weeks	162
Team 2	mixed	6	10	80	8 weeks	163
Team 3	no	6	7	80	6 weeks	162
Team 4	yes	5	6	80	5 weeks	178
Team 5	mixed	5	9	80	5 weeks	180
Team 6	yes	5	7	50	6 weeks	167
Team 7	yes	5	8	80	7 weeks	181
Average		5.33	8		6.2	170.5
Average for co-located Teams						171

Results of Research on Virtual Team Processes

The analysis for this research project proceeded as described in Chapter 3. The analysis began by the researcher inductively coding each chat for each team beginning with open codes, progressing to axial codes and then using selective coding to look for major themes or similarities and differences among the seven teams.

The open codes were displayed on a table using the pages of the chat transcripts to segment the information. Table 4, below, gives an example of how the open codes were displayed. In addition, Appendix A shows an example of a chat transcript and the coding for the transcript.

Table 4 Open Codes Matrix

Page	Chat 1	Chat 2	Chat 3	Chat 4	Chat 5
1	open codes for chat 1, p. 1; *along with researcher observations*	open codes for chat 2, p. 1; *along with researcher observations*	→		
2	open codes for chat 1, p. 2; *along with researcher observations*	open codes for chat 2, p. 2; *along with researcher observations*	→		
3	etc. ↓	etc. ↓			
4					
5					

Next, axial coding was done on each chat for each team. Table 5 illustrates how the axial coding was displayed for each team's chats. In addition, the axial coding matrices for each team are in Appendix B.

Table 5 Axial Coding Matrix

Team 1 Axial Codes	**Researcher Observation about Team process**
Chat 1 Axial codes for chat 1	
Chat 2 Axial codes for chat 2	
Chat 3 Axial codes for chat 3	
Chat 4 Axial codes for chat 4	

Once the axial coding was complete for each team, the researcher then compared the axial codes across the cases (teams) by chat and then by time frame. Table 6 shows an example of the meta matrix for the cross case analysis. The completed cross case meta matrix for this research is shown in Appendix C. The last step in this analysis involved looking for similarities and differences in the cross case analysis. The table displaying the similarities and differences among the teams for each chat is shown in Appendix D.

Table 6 Meta Matrix for Cross Case Analysis

Date	Team 1	Team 2	Team 3	Team 4	Team 5	Team 6
Week 1	Axial codes for all chats conducted during week 1					
Week 2	Axial codes for all chats conducted during week 2					
Week 3						
Week 4						
Week 5						
Week 6						

After analyzing the selective codes for each team, common themes emerged from each team that explained how the teams worked together.

Common Themes of Virtual Team Processes

There are five themes relating to work processes that were common among all of the teams. These common work processes are self-management, decision-making processes, volunteerism, an absence of conflict, and similar team protocols. Each of these processes will be explained and supported.

Self-Managed

None of the teams had a designated leader, and only one of the teams even mentioned the idea of choosing a leader. Although, every team had 1-2 team members who exhibited more initiating behavior. These team members were the ones who would enter a chat and state "what is on the agenda for tonight," or "what do we need to get done tonight." They were most likely to refocus the group, if the group got off the topic of discussing the project for too long. The same 1-2 team members were the drivers behind getting the project done throughout the semester. Examples of this initiating behavior are illustrated below:

Team 1 "No one else must be joining us tonight so let's move on"

Team 2 "Before we talk about the cases, let's make a plan of action for the audit project"
"Where do we start – what do you think of R's ideas of one draft with a schedule for revisions"

Team 3 "What if, tonight, we plan out our schedule for the project"
"Do you want to talk about a schedule, or am I the only one that does"
"We divide up the work this way:"
"What do we want to achieve tonight"
"Let's talk process, here" (process for finishing paper)
"We have two issues here....let's take them one at a time"
"Maybe we should summarize what needs to be done"

Team 4 "I hope others join the chat, but let's get started"
"Let's move on"
"Should we talk about delegation of responsibilities"
"Let's get this discussion back on track"
"Is everyone clear on where we go from here"
"What are we going to discuss this evening"
"Great, anyone else have anything tonight?"

Team 6 "I propose that we meet regularly and limit our discussion time"
"Let's talk time table"
"What is our agenda"

Three of the teams had a definite leader emerge who took charge of the project at some point during the time they were working together, usually toward the end of the project. The other teams relied on the 1-2 people of assumed a somewhat rotating, although fairly low-key leadership role during the chats.

Volunteerism

All of the teams relied on team members to volunteer for different aspects of the project. All of the teams were characterized by people demonstrating a willingness to volunteer for different parts of the project or to ask others to volunteer. Team 1 asked everyone to volunteer their strengths in the first chat and in the second chat different team members volunteered for what they wanted to do on the project. Examples of volunteer statements are shown below.

Team 3 "Can someone volunteer to assemble the paper into one document" (and two people volunteered)
"Who wants to volunteer for what section"

Team 1 B stated "I'll volunteer to analyze the data if someone else will champion the writing" MH volunteered to lead the writing.
U volunteered to help C out due to C's heavy workload at work this week
"Would you like me to edit the survey"
" I could easily put one together" (referring to cover letter)

Team 3 The team had listed the parts of the project that could be done early and someone immediately volunteered to write the cover letter and another person volunteered to develop a timeline.

"I'd be happy to do the section assembly to help match styles, etc."
"D, how can I help you"
"Can someone volunteer to assemble into one document all of the outlines without graphics for me to work off of? "I can do it"
"Can someone outline the key ideas we want in the introduction"

Team 4 " Anyone want to volunteer to crunch the numbers"

"J, do you want to volunteer for transmittal letter" J, "I'll do the transmittal letter"
C, "I'll work on polishing the final report"
"I really want to be involved in the analysis in order to pull my weight on the project"
I want to do whatever I can to help"

Team 6 "What do I need to do?" "B, do you want to help me with the recommendations, etc". "T, I sure can"

Absence of Conflict

The researcher did not observe any conflict in any of the groups during any of their chats. There were a few incidences when people expressed some frustration during a chat. The frustration was usually due to the chat format, being confusing and difficult to follow at times, or due to the fact that people were not attending the chats. There were two groups that had sporadic chat attendance by a few team members and other team members appeared to be frustrated by this. The absences were not addressed directly to the person in any of the chats, although the absent people could read the chat transcripts at any time and see the comments about their absences.

Examples of frustration

"Does anyone know what happened to K, he has not been here for the last three chats?"

"Just seems like there is a lot to do and no one is showing up"
chat 9 from team 2

Decision Making Process

All of the teams used the same decision making process to make decisions about how to complete the project. For some teams the decision making process was evident in the first chat; for other teams it was not used until later in the process. The decision making steps the teams used are described on the next page.

Step 1 Someone puts forth an idea or suggestion
Step 2 Other people offer suggestions and ideas around the initial idea
Step 3 Someone summarizes and synthesizes ideas and presents conclusion "It sounds like this is what we should do...."
Step 4 Team members signify their agreement with final synthesis

Examples of Decision Making Process

Ca: Do you think we need to push back the rough draft due date? We originally set the 7th as our first draft date
M: I have no life, so I could go ahead with getting something together
B: I can email the draft summary right now, so that you can start looking at trends
C: If the surveys are not mailed until the 2nd that may be tight
M: True
C: I will not be able to begin work on mine until Wed. due to work schedule
Ca: Has anyone heard from U?
C: Should we extend it a couple days, to maybe the 9th
Ca: I am concerned that he is not aware of the plan.
Ca: I think the 9th sounds good
M: Wasn't the plan laid out in your email
Ca: Will that allow you enough time, M?
M: The 9th is OK with me.
CA: OK, then, let's say rough drafts emailed by the 9th

Another example:

Context for this chat - discussing what background questions to include and what questions to delete.

D: The question is on all of these questions: what will we do with it if we collect it?
D: The more categories - the more analysis
T: Do we look for patterns in answers?
D: Are we going to look at data based on their length of time with the organization? If so, then collect it, if not then leave it out.
D: What do the rest of you think?
R: I thought we would only look for frequency, not correlation to any demographics.
Ra: I think we need to think about organizational culture
D: Right, Ra
D: Ra, explain further.
Ra: To understand organization culture , an employee needs to be there for a couple of months (approx. 1 year)
D: Yes, but it only makes sense to collect it if we plan to analyze it that way and use the information

W: TS, if you feel comfortable with collecting the information – submitting it and then we will have it to fall back on.
R: agreed.
TS:OK, I will leave it in, but change the scale
W: Agreed
Ra: Agreed
D: I'm a minimalist, I'd probably take out a bunch of questions, but whatever the group wants, I'll support

Similar Team Protocols

There are six team protocols that are similar among the teams. The term protocol is being used to describe team norms for a team member's behavior during the team chats. Overall, team members exhibited extremely polite behavior toward each other and this is evidenced in the examples of the team protocols discussed in this section. The common team protocols observed during the chat include greetings and good-byes, thank-yous, communicating non-verbals, discussing group process, summarizing, and the lack of meeting management processes.

Greetings and Good-byes

There are similar patterns of greetings used by all teams. The chat log indicates when someone has joined the chat because it states, "Joseph Miller has joined the chat." Each person is greeted as they join the chat, whether it is at the beginning of the chat or later. If a team member joins the chat later, everyone stops the conversation to greet the new person. At the beginning of the semester, people introduce themselves when they joined the chat for the first time. Examples of greetings are shown below.

Examples:

B. G. has joined the chat
"Hi B"
"B, you're the new guy did you bring the beer?"
"Good evening, sorry for missing the chat on Monday"

Examples:

WP has joined the chat
DB: Hi Wayne
WP: "Good evening"
RJ has joined the chat
DB: "Hello Ranga"
RJ: "Hello everyone"
RY has joined the chat
DB: "Hi Robert"
RY: "Hello all"

Examples:

Team 2: "Hi Steve, ☺"

Team 1: "MaryHelen, we have not 'spoken' before, good to have you"
"Do you go by Mary Helen or Mary"

The teams waited until a majority of the team were present in the chat before beginning to conduct business. There was a hesitation to proceed too far with decisions until the majority of the people were present and able to give their input and opinions

At the end of each chat, all team members said good by to each other before they exited the chat. The good-byes became more personal as the team worked together. The good-byes changed from a simple "good-by" or "I'm signing off now" to more personal and individual good-byes. They wished each other well, told team members "good luck" on work projects, encouraged each other to enjoy their weekend, and said things like "I hope you are feeling better" to team members who were ill. These personal good-byes were not evident in the first chats, but became warmer and friendlier as the group worked together.

Examples

"Have a good week, we'll miss you at the next chat"

"Nice talking with you, have a good night"
"Chat with you next week, take care, all"
"I look forward to working with you all"
"Good luck, C, on your trip"
"Enjoy your weekend, guys"
"Have a great night"
"Have fun is snow country, R"
"Thanks, team, have a great weekend ☺

Thank-you's

All of the groups do a good job of thanking each other for their contributions and work. They frequently express thank-yous to different people for the work they did and the contributions they are making to the team. Some groups do more of this than others, but all groups have some evidence of this behavior. Examples of thank-yous and appreciation are shown below.

Team: 1 "Thanks for all of the work you did"
"Yeah, B"
"Yes, you are doing a great job"
"That is a good idea, C"

Team 2: "R, you brought up a lot of good ideas"
"The changes to the timeline look great"

Team 3: "I think the paper looks much better, everyone has done a great job"

Team 4: "We appreciate you taking on the survey, J"
"J, yeoman's job on the data gathering
"C. thanks for setting up the format for the paper"
"P, good job on the narrative"

Team 6: "Our introduction was very well written"
"I think you had some good ideas to include"
"I thought everything sounded great" You really tied everything together well"
"Your introduction was very well written"
"I thing you had some good ideas to include"

Team 7: "Nice job, T"
"Thanks for totaling the surveys"

Communicating Non-Verbals

Some of the teams began to communicate non-verbals to each other the longer they worked together. The team members would communicate their non-verbal behaviors such as "thinking" or "listening." Some of the groups used the internet chat acronyms such as "LOL" (laughing out loud) to communicate their non-verbals. Other examples of communicating non-verbals are:

blushing from the praise
listening
taking a deep breath "ahhhhhhh"
fading (at the end of a long chat)
you gave me a good laugh,

Discussing Group Process

All of the teams had some evidence of discussing their group process. Each group, in some way, discussed how well they were working together as a team. They checked with each other as to their level of contribution and discussed how well they were working together as a team. For some groups, this discussion did not take place until their last chat, for other groups they made comments in the first chat about team process. This was not a major conversation for any group, but it was brought up in each group. Examples of group process discussions are shown below.

Team 3: Seriously, do we have any problems in the group that need to be addressed, or are we all OK?

Team 5: This is a good team
Thanks guys, thanks for being a good team

Team 1: I really enjoyed working with you"
"Are we comfortable with the way things are going"

Team 7: "The team ran quite smoothly, if you ask me"

Team 4: "Thanks, great teamwork, I think?"
"Too bad A wasn't here"
"Everyone feel like they got a chance to contribute?"
"Yup"
"P, any concerns about our teamwork"

Team 2: "Well, we're all in the same boat, I'm sure we'll work our way through this. That is what a team does best – WORK TOGETHER!"

Summarizing

Due to the convoluted nature of chatting on-line, it is necessary to frequently summarize what has been discussed, what has been agreed to, and who is doing what. The teams that summarized the most frequently were less likely to get frustrated with the communication medium and less likely to have misunderstandings. All of the teams used summarizing, some of them were better at it than other. Some of the teams recognized the importance and would ask someone to summarize at certain points in the conversation. Examples of summarizing statements are shown below.

Team 1: So, are we in agreement that we will use ____ company?
So, I will write the introduction and source/channels section, right?

Team 2: Shall we focus on the plan so far?
Okay then. Just to reiterate our plans .....

Team 3: So, you all will get me your changed version by noon, PST tomorrow?
So, let's confirm what we agreed to.

Team 4: So, we've assigned, receiving, source and quality.
Let's summarize who has what sections.

Team 5: For a recap... company is ___ ... he will customize the questionnaire and post to our group folder for asynch review.

Team 7: Is everyone clear on where we go from here?

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agreed to. In this study virtual teams do not really manage conflict because there is an absence of conflict among team members. The team norms or protocols involve how the teams greet each other, say good-by, exchange non-verbal communication, address team processes, manage meetings, and thank or reward each other for the work they contribute to the team.

Decision making processes involve the way the teams work together to solve problems and make decisions. The teams in this study all followed the same decision making process.

The management processes involve leadership for the team, which in this study involved a self-managed team approach. In addition, the virtual teams relied on volunteerism to get the their work done.

This model, shown in figure 3 on the next page, provides a framework for conceptualizing how the virtual teams in this study work together. The model could also provide a framework for managers who are managing virtual teams to use to ensure that teams understand these processes and what needs to work well in order for the virtual team to work well together.

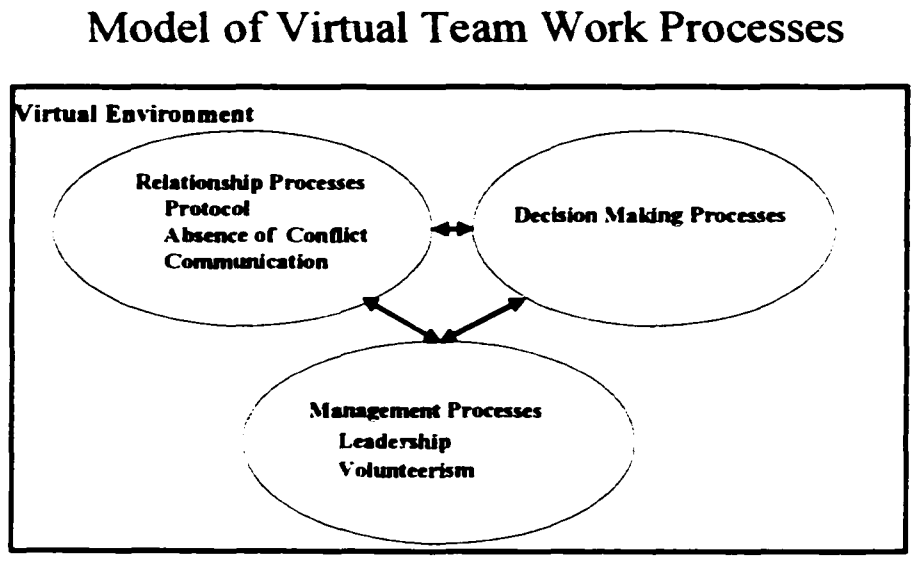

Figure 3 , Model of Virtual Team Work Processes

Task vs. Social Communication

The task and social communications were analyzed to determine how much time the teams spent discussing the task versus engaging in social communication. Social communication may involve "get to know you" discussions, "how was your weekend" discussions, "how are you doing in your other classes" discussions, and general humor and comments about the team processes. To analyze the task vs. social communication, all social communication was coded and then word counts were done to determine the percentage of time spent in task discussions vs. social discussions. Table 7, on the next page, shows the total word count, task word count, and social word count for the seven virtual teams.

Table 7 Summary of Task and Social Communication

Team	Total Word Count		Task Words		Social Words	
	Total Words	Avg. words/chat	Words	Percent of Total	Words	Percent of Total
1	14,731	1,473	13,431	91 %	1302	9 %
2	15,027	1,502	11,573	77 %	3,454	23 %
3	19,970	2,852	15,532	77 %	4,437	23 %
4	7,925	1,320	7,524	95 %	401	5 %
5	8,572	952	7,152	83 %	1,421	17 %
6	9,299	1,162	7,027	76%	2,272	24 %
7	10,399	1,300	8,982	86 %	1,417	14 %

The majority of the team chats were spent in task communication. Three of the teams had 23-24 percent social communication, two of the teams had 14-17 percent social communication and two teams had 5-9 percent social communication. Table 7 also shows that the two teams (Team 2, Team 3) that had worked together prior to this study had more social communication than the teams that did not know each other before they began working on this project. While Team 6 had a similar mix of task and social communication to Teams 2 and 3, Team 6 only completed 50 percent of their work using synchronous chats. One of the researcher's observations/ questions while coding this team's chats was - Does this team spend more time in social communication because more of their work is being done through email; and, therefore, there is not the need to be as task focused during the synchronous chats? The influence of how teams work together, whether asynchronously or synchronously, on their communication patterns may be an area for future research.

The social and task communication for each team were analyzed using the first chat for each team, two middle chats for each team, and the last chat for each team. After graphing the task and social communication from this analysis, it appears that five of the

teams had a similar pattern of task and social communication. These teams had more social communication at the beginning of their work than in the middle where the social communication decreased. The social communication then increased during their last chat. For team 3, the social communication followed an up and down pattern and for team 5 the social communication steadily increased the longer they worked together.

The teams engaged in more social communication in two ways. One, when there were only 1-2 people in the chat, which usually occurred at the beginning of the chat. Team members were more likely to engage in social communication at this time while they were waiting for others to join the chat. Two, as the team worked together longer, they were more likely to engage in social communication during the chat and at the end of the chat. The manner in which the team said good-by to each other also changed as they worked together. As discussed earlier in this paper, the good-byes tended to become more personal and friendly as the team worked together. A table showing the task and social communication word counts and percentages is in Appendix E and charts showing the task and social communication for each team are in Appendix F

Virtual Team Development

To analyze the team development for the virtual teams, each team's chat was initially analyzed using deductive codes from the literature on team development (Bennis & Shepard, 1956; Duarte & Snyder, 1999; Jones, 1973, 1974; McGrath, 1984). The task codes chosen were orientation, organization, open data flow, and problem solving; the process codes were dependency, conflict, cohesion, and interdependency. The researcher found that the task codes for team development seemed to fit the "behavior" being observed in the team chats. However, the process team development codes did not seem

to fit the "behavior" being observed in the chats. So, the researcher developed two new codes, introduction and collaboration to describe the first two stages of process team development. The definitions for these two new codes were given in chapter 3.

During the coding process it was also evident that the teams may exhibit behaviors from more than one stage of development in a chat. So, seven stages of team development were developed so the codes for each chat could be displayed accurately. The seven stages of team development used for task development and process development are listed below.

	Stages of Task Development	Stages of Process Development
1	Orientation	Introduction
2	Orientation/ Organization	Introduction/ Collaboration
3	Organization	Collaboration
4	Organization/ Open Data Flow	Collaboration/ Cohesion
5	Open Data Flow	Cohesion
6	Open Data Flow/ Problem Solving	Cohesion/ Interdependence
7	Problem Solving	Interdependence

Examples from the chats that illustrate each stage of team development are described on the next page.

Orientation - This stage involved discussing how to do this project in a virtual environment. People expressed confusing about the goals for the project and how to begin the project.

Organization – This stage of development involved choosing a company to audit, discussing the logistics of administering the audit and sharing information, and deciding who would do what.

Open Data Flow – In the open data flow stage of development, teams are using the team decision process to make decisions and there is an open exchange of ideas. The

team discusses multiple options and people seem comfortable sharing their opinions about how to do things. During this stage the team may openly critique the functioning of the team by saying things such as " any concerns about our teamwork."

Problem Solving – When the teams are in the problem solving stage they are identifying the barriers that keep them from excelling on the project and they are identifying issues that would improve team functioning. The team may discuss the expectations of the instructor for the class and how to meet those expectations and how they can work together to get all parts of the paper completed. During this stage the team will exhibit more creative problem solving.

Introduction – This stage of process development involved team members getting to know each other, learning about where they live, where they work, and what they do. The amount of time spent in this stage of development is usually very small and most groups moved out of this stage and into the next stage in the first chat.

Collaboration – Most of the groups spent most of their time in this stage of development. Collaboration was characterized by open discussion of how to get the project done, volunteering for different aspects of the project or asking other to volunteer, showing appreciation for the work that was done, and inviting team members to participate. Comments such as "J, what do you think," "can everyone support the Sat. deadline," and "you did a great job on the introduction," illustrate some of this behavior.

Cohesion – A key difference between collaboration and cohesion is the demonstration of a high level of interpersonal trust among team members and behavior that demonstrates a tightly knit team. The one team that reached cohesion seemed genuinely concerned about each other, was able to ask for and give very honest feedback about their

contributions to the project and to have more open discussions about the functioning of the team.

Interdependence – Interdependence is characterized by the ability to work through conflict, feeling comfortable exchanging differing opinions, and having rotating leadership within the group.

In addition to the team development codes just described, the researcher used two codes to describe team behaviors that did not fit the stages of team development codes. These two codes are confusion and stuck. Five of the seven teams experienced at least one chat where the chat conversation was very confusing, the team members were confused about what they were discussing and what had been agreed to, and the team members were frustrated. The number of confusing chats ranged from four for Team 1 to two for Team 3 and one for Teams 2, 6, and 7.

Four of the teams experienced the "stuck" phenomenon. The stuck phenomenon refers to a situation where the team would get stuck on an issue or topic and talk in circles and not get the issue resolved. For some teams, they would get stuck on an issue and not get it resolved until their last chat. The issue would haunt them throughout their work on the project.

The team development coding shows that the teams do follow the stages of team development as proposed by the research on co-located teams. The following figures illustrate the team development for each of the teams in this study. Although each team progressed at a different rate, they all did move through at least the first three stages of team development. All of the teams began with the task stage of orientation. All of the teams reached the organization stage of task development and in fact all but two teams

moved to the open data flow stage of task development. One team (team 3) moved to the seventh stage of task development – problem solving.

All of the teams began with the introduction stage of process team development and all of the teams moved to the collaboration stage of process development. Only one team (team 3) moved beyond collaboration to cohesion. It is interesting to note that this team had worked together in the past classes.

This analysis indicates that the teams in this study moved through more stages of task team development than process team development. Four of the teams reached stage five – open data flow, two teams reached stage 3 – organization, and one team reached stage 7 – problem solving. Five of the teams reached the collaboration stage of process team development, which is stage 3. One team reached process development stage 4 – collaboration/ cohesion and one team reached stage 5 – cohesion.

One difference between the team development process for virtual teams and co-located teams is that the virtual teams did not always move through the team development process in a linear fashion. The teams may exhibit open data flow (stage 5) team development in chat 5 and then exhibit organization (stage 3) team development in chat 6. While most of the teams did exhibit linear team development, there were three teams that did not exhibit linear team development. The figures below show the team development stages for task development and process development.

The tables displaying the analysis of each team's chat and team development coding are in Appendix G.

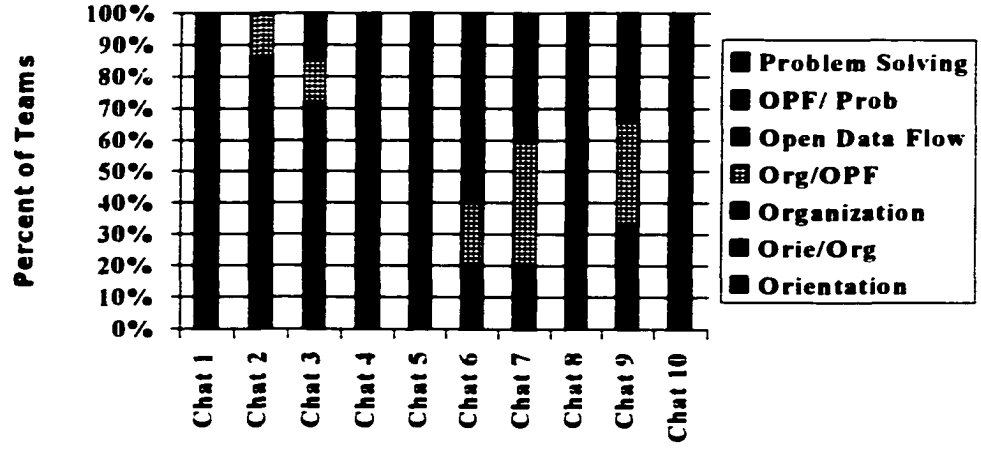

Figure 4: Summary of Task Team Development

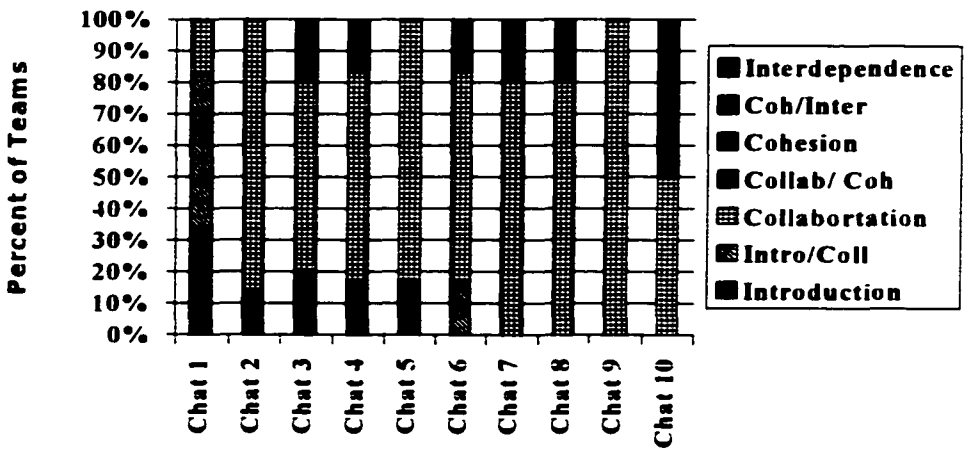

Figure 5: Summary of Process Team Development

CHAPTER 5: DISCUSION

This research project analyzed the team work processes, communication patterns and team development processes for virtual teams. The analysis showed five common work processes that were developed into a model that illustrated how these virtual teams worked together to complete a project. The research also showed that the virtual teams engaged in more task communication than social communication and displayed similar patterns in team development. This chapter will discuss these finding, compare them to current literature, and suggest areas for future research.

Team Work Processes

This study identified five virtual work team processes: self-management, decision making, volunteerism, an absence of conflict, and similar team protocols.

Self-Management

One of the most critical ingredients in team performance is team leadership (Larson & LaFasto, 1989). Lipnack and Stamp (1997) point out that the only universal role discovered in decades of small group research is leadership. They further state that while virtual teams may have single leaders, multiple leaders are the norm. Most organizations that implement self-managed work teams still maintain some sort of within-the-team leader, often called the team leader or team coordinator (Wellins et al, 1991). Usually the team leader is not a member of management but is, in fact, a team member who is willing and able to take on some of the coordination functions for the

team. In many cases the position of team leader is permanent; in others, all team members have an opportunity to rotate into the position (Wellins et al, 1991).

The virtual teams in this study did have some informal leadership that somewhat rotated between 1 or 2 people. Even though the teams in this study operated on a self-management principle, they would have benefited by having assigned team leader(s) – someone who was in charge of setting agendas for meetings, facilitating the chats, coordinating the work, and keeping track of who was doing what. To a certain extent, this happened sporadically throughout the project by individuals who stepped in to assume a leadership role on a short-term basis, but the team would have been more efficient, if it had formally agreed on a leader.

The role of leadership in self-managed virtual teams is new, and therefore there is not much literature discussing this aspect of virtual teams. Oakley (1998) suggests that virtual team leaders will need to be empowered leaders and leaders who operate democratically and concentrate on coordinating rather than directing team activities.

The literature on co-located self-managed teams states that even self-managed teams have an assigned leadership position that may or may not rotate among team members. This leadership position is an important contributor to the team's effectiveness as the leader coordinates the work and manages the communication. The role of leaders in virtual teams is not well explored, at this point, but it would seem that virtual teams will also need a leader for the same reasons that co-located teams need a leader.

Decision making

Decision making is a central process for any team. The teams in this study followed a very similar decision making process which closely parallels the

recommended decision making process for teams. Robbins (1997) outlined a rational decision making process for individuals. The rational model has six steps and is based on the work of Harrison (1995). The decision making process is

1. Define the problem
2. Identify decision criteria
3. Weight the criteria
4. Generate alternatives
5. Rate each alternative on each criteria
6. Make the best decision

While the virtual teams did not identify decision criteria, weight the criteria, or rate each alternative on each criteria, they identified the decision to be made, offered suggestions or alternatives, discussed the alternatives, and made a decision. Everyone contributed ideas. And, an advantage of the synchronous communication system is that all the ideas were contributed at the same time before they were evaluated, so the decision making did not get bogged down with evaluation before all ideas and opinions had been offered.

The team used a consensus decision making process to make their decisions, although, interestingly, there was no formal discussion about how to make decisions, they just did it this way. Johnson and Johnson (1991) propose six guidelines for making consensus decisions and the virtual teams in this study seem to follow these guidelines.

1. Avoid arguing blindly for your own opinions – present your position logically and listen to others
2. Avoid changing your mind only to reach agreement and avoid conflict – support those solutions that you are at least somewhat able to agree with
3. Avoid using voting and averaging
4. Seek out differences of opinions
5. Do not assume this must be a win/lose process.
6. Discuss underlying assumptions, encourage participation

Volunteerism

The volunteerism evident in the teams in this study would appear to be linked to the concept of self-management. Because there is no appointed leader and the informal leaders have not emerged before work needs to be done, the only way the teams have of assigning work is to rely on people to volunteer or rely on someone to ask them to volunteer. A review of the self-managed work team literature for co-located teams did not reveal detailed information on how self-managed teams decide who will do what other than statements such as "the teams are responsible for deciding how to divide up their work" (Wilson, 1995, p. 52). Some research has shown that one of the advantages of self-managed work teams is their ability to match the talents and preferences of team members to the tasks to be performed (Beyerlein & Johnson, 1994; Manz & Sims, 1989). There was some evidence of this transpiring in the virtual teams, as they did ask people for their preferences about what tasks they wanted to do. The researcher did not find any literature that discussed the issue of volunteerism in work processes, but it would be interesting to explore how co-located self-managed teams get work done and if volunteerism is a vehicle for accomplishing work like it was for these virtual teams.

Absence of conflict

The virtual teams in this study did not exhibit any conflict in their chats. This contradicts the group development literature for co-located teams and virtual teams. There have been very few research studies that have examined conflict in virtual teams, so it is difficult to know if the results of this study are unique or if virtual teams really do not engage in conflict like co-located teams. Miranda and Bostrom (1993-1994), in

laboratory studies on group decision support systems, found that the groups using computers to discuss problems and make decisions exhibited less interpersonal conflict (consistently over time) and less issue-related conflict than the groups meeting face-to-face.

To evaluate the presence or absence of conflict the researcher used the following definition of conflict "hostile or antagonistic interaction in which one party attempt to thwart the intentions or goals of another" (Daft, 1999). Based on the overwhelming belief of team researchers that all teams must go through conflict, this researcher reviewed the analysis of the teams to ensure nothing had been overlooked. While the groups occasionally disagreed on how to do a particular aspect of the audit project, those disagreements were quickly resolved and never seemed to escalate into real conflict. So, the next question is, why was there no conflict exhibited in these virtual teams. One reason may be the short time frame. The teams had eight weeks to complete this project, and then they moved on to another class. Their attitude could have been – "there is no point in getting into conflict over this, let's just get the project done." Or, maybe, they found ways to collaborate together, exchange ideas, and easily resolve differences.

Another reason the teams may not have exhibited conflict is that it is more difficult to communicate frustration and dissatisfaction with others in a synchronous on-line communication environment. A team member cannot "roll their eyes" at someone's idea to communicate disagreement, they must type out the words and therefore create a permanent record. Virtual team members may be uncomfortable communicating disagreement this way, and therefore they do not communicate disagreement, which can lead to conflict.

The area of conflict in virtual teams is relatively unexplored and therefore it is difficult to draw any conclusions from the few studies that addressed this issue. It does appear that there may be less conflict expressed in virtual teams. The role of conflict in virtual teams is definitely an area for future research.

Team Protocols

There were six team protocols that were similar among all of the virtual teams in this study. Team protocol is the term being used to describe team norms for a team member's behavior during the team chats. Kiesler and Sproull (1992) state that organizations have no norms to govern behavior and processes in virtual teams, however the teams in this study quickly developed similar norms or protocols to guide the way they interacted during their chats. This would suggest that even though this is a new form of teamwork for many organizations, that individual work teams develop protocols that allow them to adapt to the new form of work team and new way of communicating with each other.

Virtual teams using an on-line synchronous communication medium are not able to communicate non-verbals in the traditional way – giving someone a smile to acknowledge a good idea, raising eye brows to signify questions, ignoring a person's comment by turning around, or waving a hand to acknowledge someone is joining the meeting. So, the virtual teams in this study developed substitutes for the lack of non-verbals. They stop the meeting to greet someone, they communicate what they are doing non-verbally – deep sigh, thinking... etc. The team members communicate thanks and appreciation in writing instead telling someone on the way out of the meeting what a

good idea they had or instead of giving them a smile or "thumbs up" sign during the meeting.

The development of these team protocols confirms research by others that indicates that people who use on-line chats to communicate develop ways to convey more meaning in their messages as a means of replacing paraverbal and nonverbal cues (Warkentin et al, 1997). In addition, the longer the teams worked together the more likely they were to use emoticons and to communicate nonverbals. The team that had worked together prior to this study was using emoticons and communicating nonverbals in their first chat.

Jay (1976) suggested a list of guidelines for organizing and managing meetings that apply to virtual teams. The virtual teams in this study would have been more efficient if they had followed basic meeting management principles and guidelines such as establishing agendas, assigning a facilitator or leader for the meeting and assigning some one to keep "notes"

Discussion of Work Processes

When comparing the work processes of the virtual teams in this study to the recommendations on creating excellent teamwork there are some missing processes that, if they were implemented, may have helped the virtual teams to be more effective and efficient.

According to Larson and LaFasto (1989) high performance teams have a clear understanding of the team's goal and a belief that the goal is important. Other researchers (George et al, 1997; Johnson & Johnson, 1991; Scholtes et al, 1996) also support the importance of goal setting for teams to be effective. The virtual teams in this

study had an implicit goal – complete the audit project by the assigned deadline, but only one of the teams briefly discussed what their goal was for the project in terms of a grade. It may have helped the teams to have a discussion about overall goals for the project. The teams that developed a timeline for completing the project appeared to be more efficient and organized and thus, this would be a recommendation to other virtual teams.

Larson and LaFasto (1989) discuss another aspect of effective team work, which is having a results driven structure. A results driven structure has four components – clear roles and responsibilities, an effective communication system, monitoring individual performance and giving feedback and making decisions based on facts. The work processes of the virtual teams in this study included some aspects of each of these structural components, but not to the degree that they could have.

The teams used volunteerism to assign tasks, and this usually worked well as long as someone kept an up-to-date list of what needed to be done and who had agreed to do what. The communication system the virtual teams used is a difficult medium to work in at times. One virtual team expressed their frustration and did schedule one conference call in order to be more efficient at their work. One suggestion for virtual teams is to be aware of the different communication mediums available to them and use the appropriate medium for the task they are working on.

The virtual teams did a good job of thanking people for their contributions, but they did not address some performance issues, such as people not attending chats, not keeping up with the requirements for the project, and in one instance not completing assigned work. This is a difficult aspect of working on any team, and may be even more

difficult when working on a virtual team where you have not met team members in person. In general, the teams used fact-based information to make decisions.

Scholtes (Scholtes et al, 1996) outlines ten ingredients for a successful team. Five of those ingredients relate to team process. The virtual team processes in this study compare favorably to Scholtes's list.

1. Successful teams have beneficial team behaviors. They use skills and practices the make discussions and meetings more effective
2. Successful teams have well-defined decision process. They are aware of the different ways they reach decisions.
3. Successful teams have balanced participation. Each team member participates in discussions and decisions, share commitment to the task and contributes their skills. Successful teams have established ground rules.
4. Successful teams are aware of the group process.

Task and Social Communication

The task and social communication analysis for this research project confirms prior research on task and social communication for virtual teams. Chidambaram (1996) stated that virtual teams tend to be more task focused and exchange less social communication, which is what occurred in this research project.

McGrath (1990) proposed that virtual teams spend proportionally more time on relationship development activities during periods of significant transition, such as at the beginning of the project or when a new person joins the group. He further states that established groups spend more time on task oriented activities. The task and social analysis for the teams in this project did show that they spend some time on social communication at the beginning of the project, but that the social communication is a small percentage compared to the percent of task communication. The groups did pause

in their task communication to welcome a new person and get to know them, but it was a brief pause. The teams in this study that knew each other from other classes spent as much time or more in social communication as the other teams, which contradicts McGrath's assertion that established groups spend more time on task oriented activities than social oriented communication.

Much of the communication research on virtual teams has taken place in computer labs and involved a limited amount of time for interaction. Walther (1992) proposed that given enough time, virtual teams would be able to exchange enough social communication to begin to develop relationships. Walther and Burgoon's (1992) study of relational communication in virtual teams using asynchronous communication showed that the virtual communication environment did not impede the feeling of some relational development over time. This research confirms that given enough time the virtual group's relational communication will increase.

One observation made by the researcher during the analysis of the task and social communication was that the team with the least amount of social communication and the least amount of communication overall was comprised of all males. This team had fewer chats, they were more directive with each other and had very little social communication. While gender communication was not a part of this study, the researcher suggests that an area for further research would be the impact of gender on the amount of task and social communication in virtual teams.

A second observation made by the researcher involves uninhibited communication in virtual environments. Kiesler et al (1984) research (using students in a computer lab setting) showed that virtual group members are more likely to express their

opinion and engage in extreme behavior toward others in virtual groups than in face-to-face groups. Hiltz et al (1986) research with corporate managers as subjects reported that about half the CMC groups had incidences of uninhibited behavior. While this aspect of communication was not a focus of this study, the research did not reveal any extreme or uninhibited communication in any of the chats. In fact, all chats were characterized by very polite, considerate communication.

Research on small groups shows that interpersonal communication constitutes an average of 45-75 percent of communication in small groups (McDonald & Gibson, 1998). The research on the virtual teams in this study would suggest that interpersonal communication in virtual teams is very different from that is co-located teams

Other areas for future research on communicating in virtual teams are:

- Effectiveness of the communication in virtual teams
- The role of communication in creating trust in virtual teams
- The role of communication in building relationships and are relationships needed in virtual teams, do they lead to higher performing teams.
- Communication roles in virtual teams – do virtual teams exhibit the same communication roles as co-located teams.

Team effectiveness as a research question was not a part of this study, however if the final grade on the paper is used as a measure of team effectiveness then it appears that the virtual teams were as effective as the co-located MBA teams working on the same project. The average grade for the virtual teams was 170.5/ 200 and the average grade for the co-located teams was 171/ 200.

Team Development

This study strongly suggests that virtual teams develop in some similar ways to co-located teams. The virtual teams in this study progressed through the stages of task

and social team development. This is one of the only studies to follow a virtual team through its whole work process from beginning to end and analyzed all of its synchronous communication. The study also confirmed previous research that suggested that virtual teams are more task focused than process focused. The study also showed that virtual teams may deviate from co-located teams in the way they develop due to the lack of dependency behavior and conflict behavior. This finding contradicts some of the predictions about virtual team group development made by other researchers. Duarte and Snyder (1999) and McGrath (1990) state that teams can move through the social stages of team development at different rates than they move through the task stages of team development. This research project supports this concept. The virtual teams in this study moved farther in the task development stages than in the process development stages. This seems logical given the fact that the groups spent the majority (76-95%) of their chat time communicating about task topics compared to social topics.

It might seem likely that the groups that had the most social communication would have moved through more social development stages, but this was not true. Of the three teams with the highest percent of social communication, two of them reached stage 3 (collaboration) and one team reached stage 5 (cohesion). Of the seven teams, five of them reached the collaboration stage of team development and one reached the cohesion stage of team development. So, the amount of social communication did not appear to have an impact on the social team development. It should be noted though, that the team that reached stage 5 of team development did have the highest total word count, in other words they spent the most time together in on-line chats. The eight week time frame for

this study may have precluded the social development of the teams. It could be that virtual teams need longer than 8 weeks to demonstrate social team development.

The researcher did not observe that the team work processes changed substantially as the groups worked together. The groups continued to rely on volunteerism, decision making, and the established team protocols to get their work done. The mix of task and social communication did change slightly and by the end of the project the same people were doing most of the initiating or informal leading. There was no change in conflict, i.e. the more teams worked together they still did not engage in conflict.

Research on co-located teams does show that time has an impact on teams being studied. Several researchers have found that a team attitude, performance on tasks, involvement in decision-making, and levels of productivity change over time. Watson and colleagues (1993) conclude that the "performance characteristics of newly formed groups are unquestionably different from those of longer-term groups" (p. 593). So, it is important that virtual teams are studied in total (not just at a certain time in their work process) and that they are studied over longer periods of time.

This study contributes to our knowledge of how virtual teams work together because it studied all virtual team synchronous interactions over an 8 week time frame. This is more time than prior studies that have focused on virtual teams working in computer labs for limited time periods. But, it would be interesting to follow a virtual team over a 6-12 month time frame to determine if the length time they worked together changed their work processes, social and task communication and team development.

Summary

This chapter discussed the results of this study on virtual team work processes, social and task communication, and team development. The team work processes for the virtual teams in this study were self-management, decision making, volunteerism, an absence of conflict, and similar team protocols.

The teams in this study operated as self-managed work teams and were able to accomplish their task in the given time period. They may have been more effective, however, if they had appointed a team leader to help them coordinate their work and facilitate their on-line meetings. Following meeting management principles would also have helped them to reduce the number of confusing and frustrating chats. Their decision making process followed a generally prescribed effective decision process and they were able to effectively exchange ideas and include everyone's opinions. The teams generally decided who would complete what aspects of the project by relying on people to volunteer or be volunteered. This seemed to work well for the team as long as someone was keeping track of who was doing what.

The teams did not express any conflict in their chats and appeared to be able to resolve differences quickly. This finding contradicts the co-located team development literature, but does have some support from one study on conflict in virtual teams. All of the teams developed similar team protocols or norms. The teams quickly developed protocols which guided the way they interacted in their team chats. The teams found ways to communicate non-verbals, which confirms research by others that indicates that people who use on-line chats to communicate develop ways to communicate more meaning than the typed word.

The results of the task vs. social communication analysis confirms prior research on task and social communication in virtual teams. This research did advance knowledge about virtual teams because most of the other research on communication in virtual teams was done in college computer labs. This research confirms that virtual teams working in a virtual environment that approximates an organizational setting also engage in more task communication than co-located teams and implies that communication for virtual teams may be different than communication for co-located teams.

This study strongly suggests that virtual teams develop in some similar ways to co-located teams. The virtual teams progressed through the stages of task and process team development, although the stages of process team development needed to be redefined to better fit the experience of the virtual teams. This research supports the concept that teams may move through the task and process stages at different rates.

Recommendations

Listed below are some recommendations, based on this study, for virtual teams focussed on educational projects.

1. Choose a team leader(s). Make sure there is someone in charge of coordinating the work and keeping track of what is being done.
2. Follow meeting management principles for your on-line meetings.
3. Spend some time to get to know each other, learn each other's strengths and skills.
4. Use emoticons, communicate your non-verbals, and find ways to create social presence for all team members.
5. Understand the strengths and limitations of computer mediated communication systems. Understand what you can do to minimize the disadvantages of communicating via technology.

6. Model good team processes such as decision making processes and team protocols.

7. Discuss and establish performance and attendance expectations at the beginning of the project.

8. Create time for informal communication that will help to develop relationships. Research does show that co-located teams with the best interpersonal relationships are the most effective. Until research shows that virtual teams are different, building relationships with team members seems to be the right thing to do.

Summary of Areas for Future Research

Several areas for future research have been suggested in this chapter. Listed below is a summary of those areas.

1. The role of assigning work in virtual teams compared to co-located teams. How do self-managed work teams both, co-located and virtual, decide how to complete their work.

2. The role of conflict in virtual teams. Do virtual teams engage in conflict like co-located teams? How do virtual teams express conflict? Is the experience of the virtual teams in this study unique with regard to the absence of conflict?

3. The role of communication in creating trust in virtual teams.

4. Effectiveness of the communication in virtual teams.

5. The role of communication in building relationships on virtual teams. Are relationships needed in virtual teams, do relationships lead to higher performing teams?

6. The role of communication roles in virtual teams. Do virtual teams exhibit the same communication roles as co-located teams?

7. The role of gender on communication in virtual teams. For example, does the gender of the team members impact the mix of task and social communication?

8. The role of time in virtual team development. Does the team development process look different for teams that work together longer than eight weeks?

9. **Validate the team development process observed in this study by having virtual teams complete a team development survey/questionnaire to statistically validate the qualitative results of this study.**

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APPENDIX A

EXAMPLE OF OPEN CODING

Text	Open Codes
Delona: So, what are we doing tonight?	What are we doing? initiate
Tony J.: well, we need to find a group of 30 to audit	need to find group to audit
DeLona: communication audit plans?	discuss comm audit plans
William Shall we discuss our group project?	discuss group proj
DeLona: Yes. Let's get it done early.	let's get it done early
DeLona: Deadline DeLona	deadline Delona – humor
William: yep	agree
Nolan: Right--Anyone know any 30-person division/companies willing to get audited?	anyone know group we can audit
William: I hope it is not like this outline.	hope it is not like outlines
DeLona: What Wayne?	What?
William: I am working on my communication outline for case #1	working on outline case 1
Nolan: What are dis-liking about the outline?	What don't you like about outline
Nolan: (dis-liking is not a word, just to let everyone know)	humor
William: Just a new and exciting challenge.	outline – new challenge
DeLona: Thank you, Nolan aka Webster	humor
William: So the audit...anybody have any ideas?	back to audit – any ideas
DeLona: thinking....	comm NV
Tony: I got the impression Ranga was going to have a suggestion	does Ranga have sugg
Nolan: There are a few small divisions at HP I have access to that I could recommend	could rec. HP
DeLona: 30 members?	30 people?
Nolan: New start-up groups with about 20-40 people	new groups of 30 – yes
DeLona: Ahhhh	comm NV
DeLona: Did she say minimum 30 sampling size?	do we need 30 sample
DeLona: Or just approx 30	approx 30?
Nolan: I do not remember.	don't remember
William: looking	comm NV
Nolan: <--drooling with mouth open	comm NV
DeLona: hahahaha	comm NV
DeLona: And tonight's entertainment will be provided by Nolan	humor
Nolan: <-- thinking about chocolate while Wayne is looking	humor – off subject
Nolan: <-- now thinking about the fuzz in his toes...	humor
William: approx. 30 members	confirm – approx 30
DeLona: The question: shall I get into the Godivas I got for my husband for Valentines? Or would that be tacky?	humor
William: this is not a question that should be asked in front of Nolan.	humor
Nolan: Members in the group or members to sample within a big group	humor
Robert: has joined the chat.	
Nolan: As for the Godivas, why didn't you buy two boxes??	welcome Robert
Nolan: Robert!	
Nolan: Welcome back!	welcome Robert
DeLona: Now there's a plan.	
Robert: trouble with my ISP	trouble with ISP
DeLonal: We're talking about the audit	discussing audit
William: "an organization that employs approx. 30 members."	need org. with 30 members
DeLonal: Looking for ideas for a group to audit	looking for ideas – group to audit
Robert: How about that audit assignment?	
Nolan: So do you have any 30 member groups you work with/know about?	do you know of 30 member groups
DeLonal: NS has suggested one option – startup group of 20-40	NS has an option
Robert: Anyone in a 30 person org?	anyone in 30 person group
DeLona: \Do you have any ideas?	do you have ideas
Tony: my group is about 30 people	my group =30
Tony: but they are very bad about filling out surveys	not good at comp. surveys
Robert: I figure that we should contract ourselves out and see if we can get paid for this service!	contract ourselves out and get paid
Tony: I know from BG620	
DeLona: have to provide chocolates	humor
Nolan: There's a division called DHS (Digital hardcopy services) at HP that is relatively autonomous with about 30 people	30 person group at HP

Text	Open Codes
William: will they fill out survey's?	will they complete survey
Nolan: I suspect we'll be doing the surveying in person by phone???	we will survey by phone?
DeLonal: I'd considered offering it to one of my clients, but I don't think we could turn that around in time	could offer to a client but not in time
DeLonal: NS – why not print?	why not a print survey
William: agreed	agree
Nolan: Because then you help them fill it out, you know they've done it, and you can control the time, etc.	reasons for a print survey
Nolan: But print could work just as good...	print could work well
William: NS - KP sends her best.	
Nolan: depending on the group	depending on group
DeLona: I'm thinking it would be easier, though we'd have to do a couple of rounds	it would be easier
Robert: I could ask my group at work, I am not sure how to split it to 30	I could ask my work group
Nolan: Ha ha, Wayne! I've given her and her team a hard time lately...	
DeLona: send it out more than once to get an adequate sampling, not that 30 is an adequate sampling	send it out more than once to get 30
Robert: My direct group is only 20 and the bigger group is like 100	my direct group only 20
DeLona: When's the deadline?	when deadline
Nolan: I think we might be more successful to actually find an individual organization, whether an actual division or a company...	better to find ind, org
Nolan: maybe	maybe
Robert: Deadline 17th	deadline 17th
DeLona L. Bell: of	of
Nolan: drumroll	
Robert: March	March
William: 3/17/1999	
Nolan: whew!	comm NV
DeLonal: do we write a report?	do we write report?
DeLona: I know, I know, I should have this all committed to memory by now	I should know this
Robert: Yes - that we have to give to the organization that we survey	yes, we write report
William: 10-12 pages in #12 font.	10-12 pg #12 font
William: 10 points will be deducted for each page over.	10 pts for each pg over
Nolan: You've got to worry some when they start dictating font size	worry when they dictate font size
Delona: We could probably divide it up – one person do survey, one or two tally results, one or two write paper – everyone review it	we can divide up responsibilities
William: Agreed.	agreed
Nolan: Sounds like a good division of labor. Survey person could be the one closest to the most appropriate org.	sounds like good div. of labor
William: Let's focus on a company first.	let's focus on co. first
Robert: yes a company	yes
Nolan: What if we all take the next week and look at our environments	take a week to look at options
Nolan: Then report back with recommendations	report back w/ rec
Nolan: then we can all choose from what everyone has found	then we can choose
DeLona: I'm a little worried about putting it off until then	worried about putting it off till then

APPENDIX B

AXIAL CODING TABLES FOR EACH TEAM

TEAM 1 – CHAT SUMMARY

Chat 1	**(Find Date)**
Get to know you – tell me about yourself and your job Let's set up a schedule to meet and discuss individual strengths D-where to do audit S- meeting for a late arrival to chat More new people joined chat – more get to know you and do you know ____? Agreed on chat times D-time line for proj. D-how to divide up work Asked people to vol. their strengths S-what they had agreed to	Decision making pattern is established in first chat there is a discussion on some topic someone makes a proposal they all agree
Chat 2	**(Find Date)**
confirmed agreement on co for audit D-how many participants needed for survey D-logistics of audit some volunteering from group members as to what they will do on proj Asked each others ages "No one else must be joining us tonight so let's move forward" D-next meeting and what do we need to do next Confirmed what everyone will do	
Chat 3	**2/14**
New people joined chat for the first time – "We have not spoken before, MH, good to have you" Spend time getting to know MH D-how to save chats *(for third or fourth time)* "Do we want to look over changed and have C's input or just decide among ourselves" – you know C better than us- it's up to you D-letter , gave sugg C joins chat – MH introduces herself and info is exchanges	there are some norms for VT – introducing each other, always very polite, welcomes, good to have you etc. people are very willing to volunteer to do things, appears people are not reading previous chats – don't remember agreements this group spends a lot of time on some of the minor aspects of project, i.e. reminding people how to save chats, discussing letter etc.
Chat 4	**2/16**
"What is our agenda for tonight" Confusion about who is doing what – "I thought you were doing kind of comments Did anyone look at the letter that was on tonight's agenda? D-customizing survey D-what should be prepared for Wed meeting – this question was asked 5 times by one person and no one answered	there is one hi task person in team who seems to be very focused on task- what is next, what do we need to do – I don't have time to waste- type of attitude does this attitude keep others from engaging in social comm? people were confused about who was doing what some things did no get done because of this – no one seemed to get angry or upset – those that were confused and did not complete tasks said they were sorry and would get work done ASAP appears they were not paying attention to each other in the meeting-ques. are being asked that have already been answered-do not appear to be following agenda. C not as directive as usual, not as task focused-much more confusion in this meeting-no one leading the meeting. First example of non-verbal cues "think" Confusion with four conversations going on at once – no one asks for clarification or calls for time out

TEAM 1 – CHAT SUMMARY

Chat 5	**2/22**
D- how administration of audit went What is next step? D-need to analyze data B- vol to analyze data if someone else would champion the writing – MH vol to lead writing D-next chat time	if they had a timeline this would not be a question need to appoint a leader for each meeting even though they agreed on weekly chat times they spend time at each meeting discussing next chat time
Chat 6	**2/25**
Did everyone read e-mail (email sugg framework for tonight's chat) not everyone had read email MH says she will be editor – a couple people volunteered their communication styles. Driver etc Each person volunteered for what section of the paper they wanted to work on S- what each person is doing "Do we have guidelines on how to write up each section Someone had completed a timeline for proj. Sugg – discussion items for next chat	a problem – ind. people are not keeping up with req. and what needs to be done on the proj. are they using project mgt. skills and processes less poorly than a co-located team would?
Chat 7	**2/28**
D- exam in BG 630 D-how many surveys are back D- timeline – do dates still work – D –new dates for timeline Everyone agreed on new dates Does anyone have input on how report will be written? U – has not been to chats – "if U does not get his section done will ___ be backup – yes C-MH – "why don't you be directive and tell us what you need and we will do it D- when to meet again	first discussion about something other that tasks for BG 625 info on how to write report is on tapes – people not taking personal responsibility for understanding require. first sign of humor – more discussion of other topics outside of BG 625 – then "I apologize for the digression are there other things we need to discuss" a norm for VT – all task focus not much social communication
Chat 8	**3/4**
D- confusion about when this meeting was scheduled – some thought it was last night – some tonight S-let's set up agenda for tonight on agenda is format for writing up report U – not sure what I am supposed to do D everyone's responsibilities C – stated all of the assignments are in the progress memo I sent – some had not read memo D-writing format and timeline ½ page of social conversation discussing what other classes people were taking and what is going on in their lives U vol to support C due to C's very heavy workload	more ongoing confusion in this group when to meet – who is doing what more personal goodbyes -

TEAM 1 – CHAT SUMMARY

Chat 9	**3/6**
While waiting for others to join the chat there is personal conversation – how was your video, personal work sched. etc. D- how long should each section of the report be Agreement on length of each section. Confirm who is writing about what Agree – on due dates D-what is background info D-ways to write up report thanks to Beth for her work social communication then goodbyes	amount of social communication is increasing – not everyone joins each chat- people are missing and others do not know why as each person joins the chat they are acknowledged and welcomed
Chat 10	**3/13**
Social comm. – how was video pres. D-status of everyone's section – who is done, who has posted their section. General discussion of when each person will post their section – "are we comfortable with the way things are going" MH you are doing a great job D-should we cht one more time before we send in report S-how to handle draft – several sugg, agreement (dec. making process followed) Clarified agreements	positive comments – everyone seemed in harmony and agreement about status of report. has not been any sign of frustrations with report process, tech, comm etc. very positive goodbyes – this is the end of the group – "I think you all did a great job" I really enjoyed working with all of you" C-(the task person) "is it quitting time?) effectively stopped the flow of positive comments – everyone then said goodby may have discussed their communication styles during email chats because they all knew each other's styles

TEAM 2 – CHAT SUMMARY

Chat 1 1/26	
Hellos, discuss cases, feeling overwhelmed, discuss number of team members, do we need another team member (discuss pros and cons then call for a vote). Discuss chat time audit due date Discuss – does anyone know of a company Discuss- how to approach assignment Agree – study audit requirements and meet next week Humor – make sure chat time does not conflict with super bowl S- Where do you live, do you know ——— etc,.	Voting process for decision making shows up in first chat A sugg is made-ideas are offered about the sugg, then a call for a vote some humor – chat time and super bowl. personal conversation in first chat
Chat 2 2/1	
D – ideas for audit, who to audit D – how to do this project virtually S – different co for auditing D- ways to divide up work D- pros and cons of using Steve's team D-how to administer and analyze survey results Made decision about which co to use for audit digress – to discussing cases, Before we talk about cases let's make a plan of action for audit D- logistics of distributing survey and analyzing results D-next chat time Confirmed plans	Some members appear to know each other from other classes but they have not all worked together on virtual projects Made decision about what co.. to use during this chat fairly early compared to other groups
Chat 3 2/3	
New person joins chat – welcome to new person Discuss – what employees should be included in survey Decision process used Summarized agreements so far – someone vol. to write cover letter someone vol. to dev timeline Comments – good ideas and thank yous D- what needed to be customized on survey and how to customize Asked – what else do we need to discuss D- next chat time Reviewed who will do what by when Goodbyes – more personal goodbyes	group seems to be more supportive of each other with thank yous and good idea comments group does a lot of agreements on what has been decided and what will be done next and by whom More evidence of more communication roles, more roles present more personal goodbys
Chat 4 (Find Date)	
Thank you for doing cover letter Brief discussion of cases What is on agenda tonight New people join chat and are welcomed Update on status of survey D – what is next step in survey D- how to tabulate survey responses and distribute to team members D- should we publish written responses on survey D- cases, video, communication styles, and people volunteered their styles Any thing else we need to discuss D- next chat time goodby	emoticons are being used – used more often than a new group warmer, more personal goodbyes, not just goodby, but thanks team, have a good weekend, see you later

TEAM 2 – CHAT SUMMARY

Chat 5 2/15	
First 2 team members to join the chat exchange personal information, one of them is new team member – hellos and thanks for work D-status update on survey, need general information about co. D-how to post and share survey data D-sports D-cases and next chat person missing from chat – does anyone know what happen to – no one did (but they asked)	
Chat 6 3/1	
D- general survey results thanks to T for compiling results I – what is next step I – we should work on initial draft of report D- how to write up individual sections – much discussion and asking for clarification on how to write up results and what should be included in each section D – how to write up rec. where do rec go D- can drafts of ind. sections be done by Sunday – this is date on timeline D-next chat time – meet on Sunday to review sections D-cases and video proj. Goodby	people not keeping up with what the requirements for the report are so a lot of chat time needs to be taken to discuss group tried to follow timeline set at beginning of proj. good idea abrupt goodby
Chat 7 3/7	
Thank yous D- video project "how was your presentation, how was your grade? I-What is our next step? D-how to review report and give feedback D-rec vs. conclusions D-what should be in appendix D-need to take similar approach to writing D- using # vs. % each person gives opinion and then call for agreement confirmed agreements – what will be done by when time for next chat D-video proj and how to do it - suggestions	more confusing chat – several times people made suggestions that were not acknowledged until suggestion had been made several times – someone suggested going thru each section of report and discussing what should be there – a good idea, but it was not followed. several times people asked questions – does time frame still work and it had to be asked several times before it was answered decision to use # instead of % not a good decision from grading standpoint
Chat 8 3/9	
D- video projects and grades – "that is still a good grade D- all of the versions of the report make it really hard to edit "we need to condense and shorted." D-ways to review all versions and all of the comments D- visuals for report I – where do we start – what do you think of R's idea of one draft w/a schedule for revisions. D-how to edit final version Finally one person volunteers to do the final edit, cut and paste	

TEAM 2 – CHAT SUMMARY

Chat 9 3/13	
First 2 people discuss "what is new" final exam. did you get snow etc Many thank yous for work done on report Discuss what classes they are taking next term Do you have kids etc I – need to divide up remaining sections – do you agree Not all members are at chat – some comments about this – don't they care about final product D-additional revising that needs to be done some suggestions a Chat again tomorrow	2 pages of personal. social chat
Chat 10 3/14	
"Paper looks great D-final exam. and when everyone is taking it More social discussion about other classes etc I – so do need to do any special tonight? Does anyone have any final comments of suggestions More changes are sugg D – course Many thank yous It have been great to work with you Thankyou Hopefully we will work together again Good luck next term Do I have everyone's ok to submit paper? Thanks for every thing – you have been great to work with etc.	

TEAM 3 – CHAT SUMMARY

Chat 1	**2/2**
D-grades from last semester, congrats to each other on grades I-what is on agenda for tonight – need group to audit Humor – choc for Valentines day D-logistics for audit, when it is due S-how to divide work D-when to make decision on co, will list options decide on Fri. S- agreements D-cases for class, who has watched video, who has completed first case D-teachers for this semester and last semester D-mentioned a work proj and others gave him sugg on how to do it Reviewed what they agreed to do again	group seemed to know each other, they were very comfortable with each other, honestly exchanged opinions about classes displayed humor in first chat – discussed personal information
Chat 2	**2/9**
Hi, how are you, discussed how first case should be done D-adapting survey D-analyzing survey data D-how to divide up work D-sched and timeline for proj. – set dates confusing conversation – then "who is on first? where are we in this conversation" D-changes that need to be made to survey and who would make them Call for a timeout – "everyone breath, need to regroup and get everyone on the same page" Group all took a breath – "ahhhhhhh" D-nego when changed should be made – D-deadline for each person's work Confirmed dates for action items and who would do what D-analyzing data Q "How are we doing" "It's a wrap" personal comments – I have the flu – hope you are better confirmed agreements on what will be done by Fri.	conversation became very confusing and convoluted many conversations and topics going at once displays of frustration with confusing conversation – "I want to have a phone conversation " some group members not comfortable with timeline – recog D's value – pushes everyone to get things done. personal comments and soc. exchanges in 2nd chat. displayed emotion (frustration) communicated non-verbals
Chat 3	**2/15**
Hello, how are you, D-BG 620; then Back to BG 625 D=grades on first cases, expressed frustration w/grading I-"what questions remain unsettled tonight" D-discussed survey questions and what needed to be modified some group members expressed questions to each other I don't understand what you mean" "Here is my suggestion" Differing opinions, but "I'll support what the group wants" Confirm agreements "Are we all OK with 5 pt. scale" "What do you think" "Here is my sugg" "That is a good pt" D-how to transfer data from collector of surveys to data input person "Other question" T leaves chat "T is stressed" "Do we need a group hug" "A team hug – Yes" T-I'll play devil's advocate – go ahead – "It appears that I am the only one who cares about this issue – what do the rest of you think" D-pros and cons of adding questions Agreed on changes D-other class assignments Asked T – what else do you need "Thanks for feedback" Summarized actions that were agreed to	much more open exchange on what they think, offering different opinions, more like a discussion" than everyone offering opinion and decision made??? acknowledgement that people are stressed – group hug acknowledged different opinions asked what other think When a team member was quiet for awhile, someone would invite their participation- ask what they thought

TEAM 3 – CHAT SUMMARY

Chat 7 3/(Date)	
personal discussions. arrange to meet in chicago when two are there on business D-paper format "I think the paper gets better each time we look at it" more personal conversation D-expectations of grader. prof. co. general agreement that paper is good D- who will do final pieces of paper – exec. summ etc people volunteered others for jobs of they vol. themselves D- do next round of sugg. via email De-asked TS – do the results seem realistic to you given that you work for the org. – yes D-formatting each section – should all be formatted the same way Humor – we're losing it	people asked – are you doing too much are you ok doing this – genuinely seemed concerned about equally sharing work load. became a convoluted discussion lot of different discussions – most of them humor comments or obnoxious comments some off the wall comments about broad spectrum of topics examples of silly types of humor you might see in a meeting when people have been working too hard for too long – goofy humor.

TEAM 4 – CHAT SUMMARY

Chat 1	**2/15**
only 3 people at chat asked about case grades and process for completing audit two soc ques. where are you from? "I look forward to working with you" Agree on chat times	there has been some email comm about what co to audit
Chat 2	**2/20**
only 3 people in chat – 2 new people and one person from previous chat D-audit process, letter, handout surveys D-how to input data D-who is in group D-proposed how to divide up work "sounds like you can contribute in a big way" new person joins – "hope others join chat" but let's get started "Do you have any thoughts on how to delegate responsib Sugg- on how to org and speed up work D-survey format and clarified ques on survey Sugg- "let's brief at milestones of proj" D-next chat time D-how to input and analyze data Q-how do we get the other 3 people working on this (those who were not at this chat) Summ – who is doing what at this point Confirmed next chat time and who is doing what	this (how to input and analyze data) was never totally agreed on and they were still discussing different ways to do this the night before the report was done a few soc. comments – good luck on trip etc
Chat 3	**2/22**
D- how is audit going, "what can we be doing while we are waiting on surveys" "What is division of labor" "I'll help wherever you need me" "Thanks for agreeing to distribute the survey to your co. "Sure, got to help, was getting worried" (about getting project done) Exchanged phone # J will post messages once all surveys are returned "at least we are all on the same wave length" reminded people to read postings to team folder	so far – very short chats only 3 out of 6 people have been in each chat – this group seems to have a later start at proj and still does not have all members showing up for chats. implication – because no one else was doing anything

TEAM 4 – CHAT SUMMARY

Chat 4 3/6	
4 people attended chat thankyous to people for gathering data and setting up format for paper D-ways to analyze data Sugg – only analyze general trends – agreed D-how to avg # Sugg – need to discuss division of responsib. some volun of what people want to do, but this was not followed up on at this point back to D how to analyze data Sugg – how to write up report "anyone want to vol. to crunch #" Sugg – we each analyze a section of data and writie up that inof. we can divide into 5 sections Summ of what sections of survey people have vol. to do D-division of work and who will coordinate all of the info Sugg – how to compile demo data Q-what date do we need data compiled by? No discussion of date – J says I need info by 3/13 Sugg – let's meet before 3/13 so there are no surprises S- let's summ who has what sections Confirm who is doing what "what else do we need to do" Conf – how to anaylze # Sugg – everyone post what they have written so they can review each other's sections "Makes sense – should we have a page limit? agreed on this "Can someone take charge of sorting all of answers and re-post" D- how to share info from this point forward "great teamwork – let's do our sections but be aware of other section issues" everyone states what they will do by when	this sugg was followed up on and everyone seemed to agree – "good idea" Dec. making on how to divide work and analyze data B – has had many good ideas like this a few personal goodbys – have a great weekend etc

TEAM 4 – CHAT SUMMARY

Chat 5 3/13	
5 people attended chat (1 still missing) D-where is Anne, she has not been to a single chat D-still have a lot of work to do D-has A acknowledged that she is working on her section – where is A-she has posted info so we know she knows how to use tech – need to confirm she is really doing her section who will cover her section if she does not do it – P vol. "let's move on: - by JW who seems to have taken a leadership role" D-what has been done – what needs to be done D-"J do you want to vol for transmittal letter" J "I will do trans letter" C-"I'll work on polishing the final report" B-"I will do trans. between sections" Sugg – meet one more time to review Confirm agreements D-final details of pulling report together will review sub and post final on tues D-next chat time D-executive summ, rec. concl D-everyone should review report requirements and make sure they are following them B-too bad Anne is not here J-"does everyone feel like they are getting a chance to contribute" P – "any concerns about our teamwork" P- "you are carrying quite a load" J-"good point – something else you want to take charge of" P – "I can do rough draft P-"I appreciate your hard work" J-"I guess I need to delegate more"	5 people attended chat – much warmer friendlier, more personal welcomes to the chat, plus everyone shows up at about the same time interesting check on teamwork etc. this team has had much less time in chats – much less discussion of all parts of report – check % pf email comm. very little humor, social communication or get to know you information, did say thanks for hard work fairly often

TEAM 4 – CHAT SUMMARY

Chat 6 **3/16**	
4 people attended chat brief hellos "Did everyone see that Anne contacted me" Paul had already done her part – Paul's write up was better Agree that report reads well J-we all contributed S-go thru each section and discuss S-just comment on shortcomings D-how to add avg and demo sorts D-what else needs to be done – diff people vol for diff. tasks S-we have everything done in our outline except rec and spreadsheet D-whether report should include rec – *this is the 3-4th time this topic has been discussed* S-go thru outline item by item and make sure we agree on final product D-how to generate rec – should we post or vol right now Everyone vol rec. Sum – here is what is left to be done "Does everyone approve of text and edits so far? yes C-I'll org report and post tomorrow Many thanks to C for org report "I hope to see you all around in later courses –this is going to take me 4 years D- difficulties of completing MBA program "enjoyed working with you guys" Thanks for your hard work "Have a great night gentlemen"	they started to use decision making process that evident in other teams earlier – people make sugg. someone summarizes and then they signal there agreement All teams seem to get stick in a loop on some topic that they continue to discuss but never resolve this team prepared an outline of the report at the very beginning of the project and it guided them in putting the report together it was prepared after the first chat ½ page of soc comments for the first time

TEAM 5 – CHAT SUMMARY

Chat 1	**2/16**
Hello, where are you from, who is in our group Who is team lead? Who wants to lead One team member G. vol his org. Asked – is everyone ok with this, what are other options All easily agreed with this org. G. stated he would distribute survey and post results Sugg -"let's make time line for proj – not followed up on D-tailoring survey "What can we do to help you, G" Rev. info on audit proj from tapes Summ agreements so far D- meeting sched. "G, it appears that this is a lot of work for 1 person, are you sure you are OK with doing what you have committed to" G- will revise survey, and post for comments "let us know what you need" Summ – what has been agreed to so far and what people are doing "I look forward to chatting with you on Thurs.	new group, but most were familiar with chat concept. some had been in classes together before only group to ask about who wanted to be team leader, although it was never confirmed who was team lead. most groups had problems with people not remembering audit req or expectations examples of people inviting others to participate in the chat very concerned about one person doing too much work personal goodby
Chat 2	**2/18**
hello, "how are you", "how is it going" "has anyone done video yet" D-should there be a comments section on survey – discuss pros and cons of comment section D-customized survey, does everything look ok D-comment section again D-org. and mgt structure everyone made comments about some changes that needed to be made to survey – mostly editing issues Vol – people vol. for different parts of project G-are you overwhelmed? are you OK with the work load you are doing on this proj? D-next meeting time D- does survey need a cover letter – G-"already done" "Any other issues we need to discuss" We have four weeks to get this done "This is a good team"	evidence of several communication roles initiating role, refocus role rotates among group members although primarily 2 people assume this role checking again –are you OK with workload many thank yous to G this statement made fairly frequently and often during this group's chats positive comment about team early
Chat 3	**2/23**
hello, how are you, ½ page of personal chat waiting for others to show up, what other classes are you taking, some humor, "what do we need to do tonight" "sleep" D-survey update – surveys should be back so we can start crunching numbers Mar. 1 "Thanks for coming to chat" "G, again – great job" D-next meeting time "I like your meeting style, short and to the point personal goodbyes – "get some rest"	
Chat 4	**3/2**
only 2 participants initially – personal discussing since no one is here when is next meeting G-arrives and gives update – only 21 surveys back so far – briefly discuss how to get surveys inputted into excell missing part of this chat	

TEAM 5 – CHAT SUMMARY

Chat 5	**3/4**
Hello, how was your video, how did you do it "have you seen tape with audit instructions" she gives an overview of her expectations D-of who will do what at this point – data is not yet available "Next week we need to rip this thing off" "Someone needs to be final editor" – M vol to edit D-easiest way to crunch numbers Goodnites – shall we call it a night, always fun	very congenial group, lots of thank yous and ensuring that everyone is participating in chat
Chat 6	**3/9**
Hello, when do you plan to finish MBA – all vol. dates "have we assigned people to diff parts of report yet? – no personal discussion, wisdom teeth out, etc "hope you are not feeling too bad" I – as for assignments- who are we missing D-31 surveys returned, data will be posted tonight some vol. to write different parts of report missing part of chat	
Chat 7	**3/11**
Hello, discuss who has taken final, when they will take final I – "Where are we with out proj. D-list items that still need to be done "F- what do you want to do" "I can do concl. and summary D-review of paper's req. and what is written so far D-what needs to be done for appendix? J- "F are you still with us" M-I will start combining things and editing so a paper has a common voice. Q-when can each person post their work? Several people ask others to review their work and make comments Summ – what is left to do Agree to post work by Sat. and draft of report will be posted on Sun. "Can everyone support Sat deadline? D-next meeting time Summ – timeline for the next few days Goodby – have fun this weekend, thanks, have a good night	use first initial of first name to greet each other and refer to each other F-is fairly quiet in chats and has missed some chats appears that one person, G, took significant lead and did a lot of the work

TEAM 6 – CHAT SUMMARY

Chat 1 **(Date)**	
(not all team members are present) Hellos. where do you work, where is everyone. with distance education program it is hard to get everyone together S-for a company to audit, sounds good Discuss some personal information. married? do you have kids?	More social communication seems to happen when there is a smaller group on line – for example when people are waiting for others to arrive at the meeting
Chat 2 (Date)	
Brief discussions about what to do, suggested process for completing audit.	(not all team members present, others are hesitant to make decisions without them) Expressed feelings that they are getting behind because they have not started on anything
Chat 3 **2/21**	
Hellos Survey has been completed need to send it to whoever is going to analyze data D-how survey was administered, asked K – "do you think employees were honest" – yes U-vol to compile data Some discussion about survey results Discussed information about the company Discussed communication styles of different group members Discussed their own jobs and what they do- do they like it Discussed communication in the organizations that they work for Discussed next chat time	who is going to do what is decided by email a lot of social communication one individual initiates most of the social communication
Chat 4 **2/28**	
D-where is everyone, I have a lot of other things to do- D-results have not been sent to the person who will analyze data – the results have been done for a week but have not been sent out. There is a lot to do and no one is coming to chats While waiting for others to arrive they discuss BG 630 exam Da- posted what everyone is doing in email D-video presentation Confusion on who to send surveys to and who is inputting numbers	some frustration displayed because people are not showing up in chats (yet they gave everyone 100 % on peer evaluations)
Chat 5 **3/11**	
Hellos. social communication Discuss what is not done "Can we finish this thing, only one week to go" D-requirments for project D-"who is pulling this together" Sugg for writing up report D-who will vol. to pull project together Da vol to edit and org. final report D-case grades D-when does Da need everything D-what should we be looking for in survey results comment – "I don't want to leave you with too much work" – "writing isn't hard for me, I like to do it" "We have our marching orders" D-next chat more personal goodbyes	One person, Da really wrote the whole report, some others reviewed the numbers and made sugg as to what were sign findings. This is a different approach from the other groups

TEAM 6 – CHAT SUMMARY

Chat 6 3/15	
Hello. has anyone heard from K – he has not been at last 3 chats Comments – intro well done D-format of putting report together Asked for sugg for rec. and concl D-demographics of survey participants and their impact on results. D-survey results Sugg – post rec and concl by tomorrow Asked – who can prepare appendix Everyone is to review paper and make comments D-next chat Be sure to give honest feedback on paper"	In the last 2 chats Da took leadership roles in getting report done example of asking for someone's opinion who had been quiet for awhile
Chat 7 3/16	
Hello – good ideas for paper D-final exam "anyone heard from K" "Did B do results" – "Yes, everyone came through in the end" D- conclusions D-length of report D-we need some graphics D-What else needs to be done Complimented Da on writing K-joins chat at the end 2 more pages of social communications classes, tests, kids, joking and humor – teasing each other, worklife, going to school and working full time goodby	the chat ends with lots of social communication since this is the last chat, there are not any personal goodbyes such as nice working with you, look forward to seeing you in another class

APPENDIX C

CROSS CASE ANALYSIS

Cross-Case Matrix

Week	Team 1	Team 2	Team 3
Jan 24		**Chat 1** Hellos, discuss cases, feeling overwhelmed, Discuss options for co. Discuss how to approach assignment Agree-everyone study audit requirements Discuss – where do you live, do you know Decision process is evident	
Jan 31	**Chat 1** Get to know you Discuss where to do audit Agree on chat times Discuss timeline for proj. Discuss how to divide work Sum. what was agreed to Decision making process is evident	**Chat 1** D-ideas for audit D-how to do project virtually Suggestions of co to audit make decision on who to audit D-ways to divide work D-logistics for survey D-cases etc confirmed plans, summarized what has been agreed to so far D-customizing survey goodbyes more personal many thank yous and good idea comments during chat group summarized frequently what has been agreed to	**Chat 1** D-grades from last semester, congrats to each other on grades D-agenda, need group to audit Humor – choc for Valentines day D-logistics for audit, due date S-how to divide work D-decision process for co to audit S- agreements D-cases for class, who has watched video, who has completed first case D-teachers for this semester and last semester D-mentioned a work proj and others gave him sugg on how to do it Reviewed what they agreed to do again *group seemed to know each other, they were very comfortable with each other, humor, honest opinions*

Cross-Case Matrix

Team 4	Team 5	Team 6	Team 7
		Chat 1 Hello, where do you work, where is everyone. With distance ed it is hard to get everyone together Sugg-for company to audit, sound good, D-some personal information, married? do you have kids? *more social communication seems to happen when there is a smaller group on line- for example when people are waiting for others to arrive at the meetings*	**Chat 1 2/1** Discuss time zones, not read all bios, how to do this in vir environment D-who to audit, one co vol. all agree D-survey process some soc., I'm from Boise too Sugg-for dividing up work "Glad to be on team with you" *not evident at all that this is a new team, I thought they had worked together before by the tone of the first message, but later they state that they are a new team* *made decision easily about who to audit, people very willing to agree*

Cross-Case Matrix

Week	Team 1	Team 2	Team 3
Feb. 7	**Chat 2** Agreed on co. to audit Discuss logistics of survey Some volunteering from group members on what they would do Discussed what needs to be done next	**Chat 2** Brief discussion of cases What is on agenda D-next step in project D-how to tabulate results and distribute D-cases, videos, communication styles emoticons used warmer, more personal goodbyes, not just goodby but thanks team, have a good weekend, see you later	**Chat 2** Hi, how are you, discussed how first case should be done D-adapting survey D-analyzing survey data D-how to divide up work D-sched and timeline for proj. – set dates confusing conversation – then "who is on first? where are we in this conversation" D-changes that need to be made to survey and who would make them Call for a timeout – "everyone breath, need to regroup and get everyone on the same page" Group all took a breath – "ahhhhhhh" D-nego when changed should be made – D-deadline for each person's work Confirmed dates for action items and who would do what D-analyzing data Q "How are we doing" "It's a wrap" personal comments – I have the flu – hope you are better confirmed agreements on what will be done by Fri.

Team 4	Team 5	Team 6	Team 7
Feb. 7		**Chat 2** Brief discussion about what to do, suggested process for completing audit not all team members are present, other are hesitant to make decisions without them *Expressed feelings that they are getting behind because they have not started on anything*	**Chat 2** hellos, thanks for vol. your co. D-how to complete proj general discussion that people at T co. appear to be supportive of survey. Asked for vol. to input survey results Asked for someone to list steps needed to complete proj. people vol ideas about what needs to be done and then People vol. for different tasks the absent team member is also assigned tasks D-how to access survey results – so everyone can acesss data "hard to believe we are a new team – we're rolling along smoothly" D- video pres. D-next chat time *easy conversation, very comfortable, one team member uses humor, more personal communication from the beginning, does this encourage others to be more personal? more personal conversation - very personal goodbyes*

Cross-Case Matrix

Week	Team 1	Team 2	Team 3
Feb.14	**Chat 3** New people join chat for first time – everyone introduces themselves Discuss how to save chats (for 3rd or 4th time- stuck) Discuss modifications to survey People have not read previous chats, do not remember agreements Spends a lot of time on minor details of project ********** Confusion over who is doing what D-customizing survey What should be prepared for Wed. (asked 5 times and no one answered confusing conversation. they are not paying attention to what each is saying – ques are being asked that have already been answered *usually directive team member is not directive during this chat* *First example of comm. non-verbals "thinking"*	**Chat 3** D-status report of survey D-how to post and share data D-cases and next chat Asked – does anyone know what happened to? fairly short chat – update	**Chat 3** Hello, how are you, D-BG 620; then Back to BG 625 D=grades on first cases, expressed frustration w/grading I-"what questions remain unsettled tonight" D-discussed survey questions and what needed to be modified some group members expressed questions to each other I don't understand what you mean" "Here is my suggestion" Differing opinions, but "I'll support what the group wants" Confirm agreements "Are we all OK with 5 pt. scale" "What do you think" "Here is my sugg" "That is a good pt" D-how to transfer data from collector of surveys to data input person "Other question" T leaves chat. "T is stressed" "Do we need a group hug" "A team hug – Yes" T-I'll play devil's advocate – go ahead – "It appears that I am the only one who cares about this issue – what do the rest of you think" D-pros and cons of adding questions Agreed on changes D-other class assignments Asked T – what else do you need "Thanks for feedback" Summarized actions that were agreed to

Cross-Case Matrix

Team 4	Team 5	Team 6	Team 7
Chat 3 only 3 people at chat asked about case grades and process for completing audit two soc ques. where are you from? "I look forward to working with you" Agree on chat times only 3 people in chat – 2 new people and one person from previous chat D-audit process, letter, survey logistics D-how to input data D-who is in group D-proposed how to divide up work "sounds like you can contribute in a big way" new person joins – "hope others join chat" but let's get started "Do you have any thoughts on how to delegate responsibilities Sugg- on how to org and speed up work D-survey format and clarified ques on survey Sugg- "let's brief at milestones of proj" D-next chat time Q-how do we get the other 3 people working on this (those who are absent) Summ – who is doing what at this point Confirmed next chat time and who is doing what *how to analyze data was never agreed on and they were still discussing different ways to do this the night before the report was done. A few soc. comments*	**Chat 3** Hello, where are you from, who is on our group Who is team lead? Who wants to lead One team member G. vol his org, Asked – is everyone ok with this, what are other options All easily agreed with this org. G. stated he would distribute survey and post results Sugg – "let's make time line for proj" – not followed up on D-tailoring survey "What can we do to help you, G" Summ agreements D-meeting sched. "G. it appears that this is a lot of work for q person, are you sure you're OK with doing what you have committed to" "Let us know what you need Summ agree and what people are doing "Look forward to talking with you on Thurs. hello, "how are you", "how is it going" "has anyone done video yet" D-should there be a comments section on survey – discuss pros and cons of comment section D-customized survey, does everything look ok D-comment section again D-org. and mgt structure everyone made comments about some changes that needed to be made to survey – mostly editing issues Vol – people vol. for different parts of project G-are you overwhelmed? are you OK with the work load you are doing on this proj? D-next meeting time D- does survey need a cover letter – G-"already done" "Any other issues we need to discuss" We have four weeks to get this done "This is a good team" positive comments about the team early, *freq ask –any other issues to discuss,* *evidence of several comm roles*		**Chat 3** hellos – sorry I missed last week "I have had it with this assignment" – people were not returning surveys and person was very frustrated. D-how to get rest of surveys returned D-how to divide sections and work – this is brought up several times in this chat Some confusion on who is doing what Clarify who is doing what "What else needs to be assigned?" Comments – it is hard to make decisions this way" referring to the vir. environment "But – things were flowing so well before" "What else should we do – sugg – do a list of tasks and assign names (for about the 3rd time) agreement to do this people state preferences someone vol to summ all agreements "we now have a plan coming together" D-timeline confirm next chat time *expressed frustration – others quickly asked how they could help* *"T- bad day?"* *they list what needs to be done twice- but it is not assigned, convoluted conversation, some volunteering but not clarified or confirmed at this point* *having a team leader or someone in charge of this chat would have helped them to sort this out more quickly*

Cross-Case Matrix

Week	Team 1	Team 2	Team 3
Feb 21	D-how to administer audit D-how to analyze data volunteers to analyze data and lead in writing effort spend a lot of time discussing next chat time *need a timeline for proj* email was posted that suggested agenda for chat – not everyone had read D-what section of the paper each person would work on Summ what each person will do Timeline for proj has been done		**Chat 4 2/23** D-ideas for dividing up work – De made sugg for how to divide up work. others agreed and volunteered for what they wanted to do "Can we get on the phone sometime – it would be easier D-logistics for conference call and need for agenda for phone call D-"important that everyone carry their weight in getting their assignments done" D-how to analyze and graph data S-we need to talk about expectations for written report Soc. communication – travel plans etc D-picturing what each person sounds like by the sound of their voice D – brief timeline for completing project and need for more info from teacher on how to do proj. goodbys

Cross-Case Matrix

Team 4	Team 5	Team 6	Team 7
Chat 3 2/22/99 *D- how is audit going,* *"what can we be doing while we are waiting on surveys"* *"What is division of labor" "I'll help wherever you need me"* *"Thanks for agreeing to distribute the survey to your co."* *"Sure, got to help, was getting worried" (about getting project done)* *Exchanged phone = J will post messages once all surveys are returned* *"at least we are all on the same wave length"* *reminded people to read postings to team folder* *so far very short chats, later start on proj. low attendance at chats*	**Chat 3 2/23/99** hello, how are you, ½ page of personal chat waiting for others to show up, what other classes are you taking, some humor, "what do we need to do tonight" "sleep" D-survey update – surveys should be back so we can start crunching numbers Mar. 1 "Thanks for coming to chat" "G, again – great job" D-next meeting time "I like your meeting style, short and to the point personal goodbyes – "get some rest"	**Chat 3 2/21/99** Hellos Survey has been completed need to send it to whoever is going to analyze data D-how survey was administered, asked K- "do you think employees were honest" – yes U-vol to compile data Some discussion about survey results Discussed information about the company Discussed communication styles of different group members Discussed their own jobs and what they do- do they like it Discussed communication in the organizations that they work for Discussed next chat time	**Chat 4** hellos, discuss kids, what ages each person's kids are D-problems reviewing survey results "did everyone get summary of tasks and people" "Any comments on the letters I wrote" D-letters, trans, thankyou etc. What needs to be done next? "Discussing findings will be fun D-some of the survey results D-ideas and sugg on how to review survey results, analyze results and write key findings everyone is to post ideas about common themes in the results and P will summarize them *first example of dec making process* *sugg made, another sugg, refining first one is made – then everyone indicates support.*

Week	Team 1	Team 2	Team 3
Feb 28	D-exam in 630 D-new dates for timeline D-input on how report should be written One person has not been to chats – another person vol. to do his part (no display of frustration or anger over this) "why don't you be directive and tell us what you need and we will do it" first discussion about something other than tasks for this class. first sign of humor. "apologize for digression – are there other things we need to discuss about the report" D-confusion about when meeting is sched. Sugg – let's set up agenda D-reviewed everyone's responsibilities – posted on email not all had read much more social communication and more personal goodbyes *more ongoing confusion in this group. when to meet. who is doing what* While waiting for others to join chat soc. comm. D-how long each section of the report should be – agreement Confirm who is writing what and due dates D-ways to write up report thanks to B social comm and personal goodby *amount of soc. comm is increasing. not everyone joins each chat and others do not know why*	D-general survey results – thanks for compiling results D-what is next step D-how to write up individual sections – much discussion and asking for clarification D-how to write rec. and where do rec. go D-due date for individual write ups – according to timeline abrupt goodbyes people not keeping up with req. for report – a lot of chat time discussing things people should know from tapes and written info	**Chat 5 3/3** D-tech. problems – everyone had been dumped from embanet D-general discussion of survey results that should be in report I-"What do we want to include tonight" Sugg for chat agenda – assemble paper,. review and edit. format for graphics Sugg – we need to set up agenda for our meetings" D- need to sched another meeting. not ready for tonight DE-"Can someone volunteer to assemble paper into one document "I can" – 2 vol. T-I'm stressed "Oh group hug time" D-chat time for Sunday D-tape 6 from class. weather. etc Good to talk with people over telephone goodbys

Cross-Case Matrix

Team 4	Team 5	Team 6	Team 7
Chat 4 3/6/99 4 people attended chat thankyous to people for gathering data and setting up format for paper D-ways to analyze data Sugg – only analyze general trends – agreed D-how to avg # Sugg – need to discuss division of responsib. some volun of what people want to do, but this was not followed up on at this point back to D how to analyze data Sugg – how to write up report "anyone want to vol. to crunch #" Sugg – we each analyze a section of data and write up that info, we can divide into 5 sections Summ of what sections of survey people have vol. to do D-division of work and who will coordinate all of the info Sugg – how to compile demo data Q-what date do we need data compiled by? No discussion of date – J says I need info by 3/13 Sugg – let's meet before 3/13 so there are no surprises S- let's summ who has what sections Confirm who is doing what "what else do we need to do" Conf – how to analyze # Sugg – everyone post what they have written so they can review each other's sections "Makes sense – should we have a page limit? agreed "Can someone take charge of sorting all of answers and re-post" D- how to share info from this point forward "great teamwork – let's do our sections but be aware of other section issues" everyone states what they will do by when Decision making process evident	**Chat 4 3/2/99** only 2 participants initially – personal discussing since no one is here when is next meeting G-arrives and gives update – only 21 surveys back so far – briefly discuss how to get surveys inputted into excell missing part of this chat **Chat 5 3/4/99** Hello, how was your video, how did you do it "have you seen tape with audit instructions" she gives an overview of her expectations D-of who will do what at this point – data is not yet available "Next week we need to rip this thing off" "Someone needs to be final editor" – M vol to edit D-easiest way to crunch numbers Goodnites – shall we call it a night, always fun *very congenial group, lots of thank yous and ensuring that everyone is participating in chat*	**Chat 4 2/28/99** D-where is everyone, I have a lot of other things to do- D-results have not been sent to the person who will analyze data – the results have been done for a week but not sent out. There is a lot to do and no one is coming to chats While waiting for others to arrive they discuss BG630 exam Da- posted what everyone is doing in e-mail D-video presentation Confusion on who to send surveys to and who is inputting numbers	**Chat 5 3/1/99** Begin with lots of soc. comm. for about 1 ½ pages discussed other classes, missing living in Denver, what do you do "What are we going to discuss this evening" intro is good, ask for clarification – how are we pulling the report together – this is from the person who said he would summarize the info everyone posted J vol to pull paper together "how are findings, good, some common themes D-length of paper, some humor "Do we need to talk on phone? Sugg – for due dates for different aspects of proj. and time line "Is there agreement on timeline? People confirm that sugg due dates are ok D- how to discuss some of the results P-vol to summ the agreements made in this chat on who will be doing what D-more discussion of survey results What grade do we want to get? – agree on A "Are you happy with results?" directed to person who did survey on her co. "this team ran smoothly if you ask me" *appears people are not remembering items from the last chats, what they agreed to etc.* *only group to discuss all of survey results in their chat – other groups had each person write up a section of the report and then discussed conclusions and rec.* *only group that discussed goal – what grade do we want to get fairly early discussion about team process, other groups did not comment on team process until the final chat.*

Cross-Case Matrix

Week	Team 1	Team 2	Team 3
Mar 7	Social comm – video etc D-status of everyone's section, who is done, who has posted info "Are we comfortable with the way things are going" "You are doing a great job" Many positive comments, everyone seemed in harmony and agree about report. No signs of frustration. Very positive goodby "I think you all did a great job, enjoyed working with you" "Is it quitting time *(from directive person) effectively stopped the flow of positive comments and everyone said goodby.* *They knew each other's communication styles.*	Thank you D-video project and grades and how to do it What is next step D-how to review report and give feedback D-writing rec. and concl what is difference D-what should be in appendix Confirmed agreements – what will be done when confusing chat- several times suggestions were made and not acknowledged until sugg had been made several times – several time people asked questions and and they were not answered until asked several times D-ways to review all sections of report and combine into one report and edit one person finally volunteers to do the final edit D-visuals for report	**Chat 6 3/7** D- editing – doing it tonight not everyone has reviewed yet, should we wait until everyone has reviewed. – "let's discuss process, how to edit each section" D- need input from everyone D- how we should submit data TS – "I had a hard time following write-up, "Speak on TS" TS critiqued writing – provided honest feedback on other's work D- use of # vs % confusing conv. 2 conv. going on at once. then DE says, Clarify two issues – use of graphics and writing reports D-how to write up findings, how to prioritize data, need balance between writing and graphics Clarify next step – everyone will write their section and highlight 1-3 key findings – there is some frustration as people are not clear on next steps Humor – TS volunteered to do everyone "think of your peer evaluation More sugg and then agreements on how to finalize everything then – everyone is not on the same page – so let's confirm format more humor – group started writing in # vs % format "I think current plan will work 85 % of time D- agree on next deadline and plan of action Let's recap – then "Let N finish" humor and personal conversation D-peer eval along w/ humor – bribes, $ and choc.

Cross-Case Matrix

Team 4	Team 5	Team 6	Team 7
Chat 5 3/13/99 5 people attended chat (1 still missing) D-where is Anne, she has not been to a single chat D-still have a much work to do D-has A acknowledged that she is working on her section – where is A-she has posted info so we know she knows how to use tech – need to confirm she is really doing her section who will cover her section if she does not do it – P vol. "let's move on: - by JW who seems to have taken a leadership role" D-what has been done – what needs to be done D-"J do you want to vol for transmittal letter" – yes C-"I'll work on polishing the final report" B-"I will do trans. between sections" Sugg – meet one more time to review Confirm agreements D-final details of pulling report together D-next chat time D-exec summ. rec. concl D-everyone should review report requirements and make sure they are following them B-too bad Anne is not here J-"does everyone feel like they are getting a chance to contribute" P – "any concerns about our teamwork" P- "you are carrying quite a load" J-"good point – something else you want to do" P – "I can do rough draft P-"I appreciate your hard work" J-"I guess I need to delegate more" *Five people attended chat, much warmer and friendlier, more personal welcomes* *Asked about teamwork processes.* *Overall very little humor, soc. comm or get to know you comm.* *did say thanks for hard work often*	**Chat 6 3/9/99** Hello, when do you plan to finish MBA – all vol. dates "have we assigned people to diff parts of report yet? – no personal discussion, wisdom teeth out, etc "hope you are not feeling too bad" I – as for assignments- who are we missing D-31 surveys returned, data will be posted tonight some vol. to write different parts of report missing part of chat **Chat 7 3/11/99** Hello, discuss who has taken final, when they will take final I – "Where are we with out proj. D-list items that still need to be done "F- what do you want to do" "I can do concl. and summary D-review of paper's req. and what is written so far D-what needs to be done for appendix? J- "F are you still with us" M-I will start combining things and editing so a paper has a common voice. Q-when can each person post their work? Several people ask others to review their work and make comments Summ – what is left to do Agree to post work by Sat. and draft of report will be posted on Sun. "Can everyone support Sat deadline? D-next meeting time Summ – timeline for the next few days Goodby – have fun this weekend, thanks, have a good night	**Chat 5 3/11** Hellos, social communication Discuss what is not done "Can we finish this thing, only one week to go" D-requirements for project D-"who is pulling this together" Sugg for writing up report D-who will vol. to pull project together Da vol to edit and org. final report D-case grades D-when does Da need everything D-what should we be looking for in survey results Comment – "I don't want to leave you with toomuch work" – "writing isn't hard for me, I like to do it" "We have our marching orders" D-next chat Personal goodbyes	**Chat 6 3/8/99** D-virus in some of the files D-who is mailing final report – will follow timelines set rec. almost done "When does everything need to be done" D-timeline for the rest of this week review who is doing what ask for phone # in case they are needed for last minute ? confirm when updates will be done reminded people to give inputs by Friday

Cross-Case Matrix

Week	Team 1	Team 2	Team 3	Team 4
Mar 14		Many thank yours for work done on report D-classes next term, final exam, weather at diff locations D-what else needs to be done D- the fact that several members are not at chat – frustration with this 2 pages of soc. comm "Paper looks great" D-final exam when is everyone taking it Does anyone have any final comments or suggestions More soc. discussion changes are sugg for report goodbyes – it has been good to work with you – hopefully we will work together again, thanks for everything *lots of personal affirming goodbyes*	**Chat 7 3/** personal discussions, arrange to meet in chicago when two are there on business D-paper format "I think the paper gets better each time we look at it" more personal conversation D-expectations of grader, prof, co, general agreement that paper is good D- who will do final pieces of paper – exec. summ etc people volunteered others for jobs of they vol. themselves D- do next round of sugg. via email De-asked TS – do the results seem realistic to you given that you work for the org. – yes D-formatting each section – should all be formatted the same way Humor – we're losing it	**Chat 6 3/16/99** 4 people attended chat brief hellos "Did everyone see that Anne contacted me" Paul had already done her part – Paul's write up was better Agree that report reads well J-we all contributed S-go thru each section and discuss S-just comment on shortcomings D-how to add avg and demo sorts D-what else needs to be done – diff people vol for diff. tasks S-we have everything done in our outline except rec and spreadsheet D-whether report should include rec – *this is the 3–4th time this topic has been discussed* S-go thru outline item by item and make sure we agree on final product D-how to generate rec – should we post or vol right now Everyone vol rec. Sum – here is what is left to be done "Does everyone approve of text and edits so far? yes C-I'll org report and post tomorrow Many thanks to C for org report "I hope to see you all around in later courses –this is going to take me 4 years D- difficulties of completing MBA program "enjoyed working with you guys" Thanks for your hard work "Have a great night gentlemen" *This team used decision making process earlier. This team prepared an outline of the report at the very beginning of the project and it guided them in putting the report together- it was prepared after the first chat.*

Cross-Case Matrix

Team 5	Team 6	Team 7
Chat 8 3/14/99 D- difficulty of getting on embanet "looks like report is coming together" "all the parts of the project look good" D-exec. summ. some confusion about what should be in it, how long it should be, etc – agr. exec. summ needs to be changed D-what information goes where I - "What do we need to finish up" M-did not get paper done, I broke my foot yesterday "Are you feeling ok, can you still do this (I hope)" D-medical problems a couple people are dealing with "just checked the req. list, we have all the pieces" D-what needs to be done" Summ- what needs to be done Sugg – review rec. before next meetings "you guys are great" D-case 5 *honest feedback on writing* *go stuck on what is exec summ* **Chat 9 3/15/99** Hello L was big help on finishing paper Q-what is other summary L-"who is in BG 630 – everyone answers – have you rec. your test score yet – how did you do? I – what is left besides summary D-cover, how to do it, several sugg. summarized and agreement Q-have I been too dominating in the way I edited report – no – tone sounds fine D-everyone makes sugg. for editing paper in the middle of the conversation about the paper – L states I am sad – I got my exam score from 630 and it is bad the rest of the group becomes very supportive – "there is another chance to bring up grade, "It was a really hard test – and very poorly written" L-how did you guys feel about the test? more discussion about test L-thanks guys you helped to cheer me up, sorry I got off the subject but I couldn't concentrate until I talked about the test Do we need to meet tomorrow for one final review more discussion about 630 I-is there anything else? Thanks guys, thanks for being a good team "You all did a great job with the paper too J-confirms what needs to be done *followed decision making process*	**Chat 6 3/15** Hello, has anyone heard from K – he has not been at last 3 chats Comments – intro well done D-format of putting report together Asked for sugg for rec. and concl D-demographics of survey participants and their impact on results. D-survey results Sugg – post rec and concl by tomorrow Asked – who can prepare appendix Everyone is to review paper and make comments D-next chat "Be sure to give honest *feedback on paper*" **Chat 7 3/16** Hello – good ideas for paper D-final exam "anyone heard from K" "Did B do results" – "Yes, everyone came through in the end" D-conclusions D-length of report D-we need some graphics D-What else needs to be done Complimented Da on writing K-joins chat at the end 2 more pages of social communications classes, tests, kids, joking and humor – teasing each other, worklife, going to school and working full time goodby	**Chat 7 3/15/99** Updated report is posted "Did you review my comments" wrong rec initially included – now the correct ones are there "Current report looks good but need to review again D-final exam personal conversation – where do you live, what do you do, where else have you lived (2 pages) *the personal conversation took place as 2-3 people were waiting for others to show up in the chat –* *would this much personal info have been exchanged if they had not been waiting for others to show up??* **Chat 8 3/16/99** final copy looks great people sugg different things that needed to be changed to final copy – such as p #, toc not totally correct, is summary in the right place, headings OK? mostly formatting errors. "WE did it!!" "I'll repost final with changes some thanks, great going, etc. "super, thanks, by" this is groups last chat but there were no conversation about this being the end *no "nice working with you, congrats on a good job" not goodbyes because this is the end of the project, no see you next semester etc.*

APPENDIX D

SIMILARITIES AND DIFFERENCES AMONG TEAMS

Chat 1

What is Similar	What is Different
All have brief get to know you – where are you from, where do you work Discussed, briefly, case assignment Discussed who to audit Discussed next chat time 6/7 discussed due date 3/7 use decision process in chat 1	1 group discussed feeling overwhelmed 1 group more (Lr Tm 1) more soc. comm 1 group asked who wants to be team lead – only group that brought up team leadership although they did not follow-up on this question and create a team lead

Chat 2

What is Similar	What is Different
All groups had agreed on company for audit by second chat Discussed logistics for survey Discussed timeline and how to divide work Confirmed / summarized what each person would do Discussed next chat time	Tm3 – displayed emoticons, frustration, call for timeout, everybody breath, communicate non-verbals, disagreed, voiced disagreements, asked how everyone is doing

Chat 3

What is Similar	What is Different
½ greeted new person Discussed customizing survey changes 5/7 People volunteered for different aspects of project ½ Summarized who would do what 5/7	One team has very short chats, one person is taking the lead in this team and implies it is because the team is behind and others are not initiating Grp 6 more social comm

Chat 4

What is Similar	What is Different
Discussed division of labor Not much accomplished in this chat – more of a checking in time Discussed how to analyze data Group 1 – first example of communicating non-verbals 4/7 discussed timeline for project	Grp 6 has a hard time getting everyone to show up to chats – but they are doing 50 % of their work via email - but they had made decisions via email just prior to this chat about who would do what

Chat 5

What is Similar	What is Different
Provided update on audit Discussed what is done so far and what needs to be done Asked for volunteers to do different aspects of report An increase in the amount of personal / process discussion in 4 of the groups More initiating questions such as "what is on the agenda for tonight, what do we want to do tonight" Consistently thanked people for their contributions and for volunteering to do work	One group is farther along in project than the other three

Chat 6	
What is Similar	**What is Different**
Discussed how to write individual sections People volunteered for tasks that need to be done Reviewed due dates Discussed writing recommendations Increase in social/process communication	Group 3 has lots of humor and social communication compared to the others along with feedback on each person's ideas Group 4 –this is their last chat, goodbyes and "nice working with you"
Chat 7	
What is Similar	**What is Different**
Discussed timeline, due dates for report, format of report People volunteered for parts of project that need to be done An increase in the amount of social communication and discussion of topics outside of BG 625 project.	Group 1 – first sign of humor Group 3 significantly more humor -Last chat for group 3 Grp 6 –last chat
Chat 8	
What is Similar	**What is Different**
Writing format guidelines How to edit final version Very little social communication	
Chat 9	
What is Similar	**What is Different**
Format for paper, writing guidelines Social communication Review final paper Final suggestions for editing paper	
Chat 10	
What is Similar	**What is Different**
Social communication how to handle editing final draft goodby enjoyed working with you	

APPENDIX E

SUMMARY OF TASK AND SOCIAL COMMUNICATION FOR EACH TEAM

Task and Social Communication for Each Team

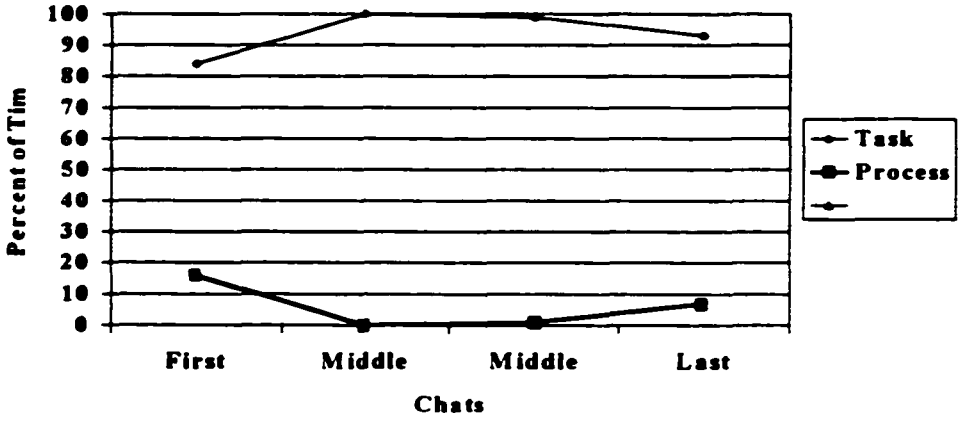
		Chat 1		Chat 2		Chat 3		Chat 4		Chat 5	
Team 1	Tot word	2597		1640		2448		3356		558	
	name	575		295		470		647 5		120	
	subtotal	2022		1345		1978		2708 5		438	
	process	325	16 07%	79	5 87%	60	3 03%	14	0 52%	0	0 00%
	task	1697	83 93%	1266	94 13%	1918	96 97%	2694 5	99 48%	438	100 00 %
Team 2	Tot word	1939		2586		1539		1459		1078	
	name	407 5		535		502 5		362 5		295	
	subtotal	1531 5		2051		1036 5		1096 5		783	
	process	498	32 52%	35	1 71%	73	7 04%	260	23 71%	211	26 95%
	task	1033 5	67 48%	2016	98 29%	963 5	92 96%	836 5	76 29%	572	73 05%
Team 3	Tot word	3420		4831		3190		2306		2208	
	name	852		1115		855		622 5		545	
	subtotal	2568		3716		2335		1683 5		1663	
	process	665	25 90%	492	13 24%	330	14 13%	464	27 56%	452	27 18%
	task	1903	74 10%	3224	86 76%	2005	85 87%	1219 5	72 44%	1211	72 82%
Team 4	Tot word	779		1805		588		2494		2220	
	name	160		395		125		447 5		615	
	subtotal	619		1410		463		2046 5		1605	
	process	93	15 02%	75	5 32%	0	0 00%	7	0 34%	37	2 31%
	task	526	84 98%	1335	94 68%	463	100 00 %	2039 5	99 66%	1568	97 69%
Team 5	Tot word	1854		1766		650		452		1168	
	name	387 5		412 5		160		105		232 5	
	subtotal	1466 5		1353 5		490		347		935 5	
	process	63	4 30%	148	10 93%	140	28 57%	9	2 59%	199	21 27%
	task	1403 5	95 70%	1205 5	89 07%	350	71 43%	338	97 41%	736 5	78 73%
Team 6	Tot word	1042		412		2384		1072		2272	
	name	175		57 5		465		235		412 5	
	subtotal	867		354 5		1919		837		1859 5	
	process	338	38 99%	29	8 18%	370	19 28%	304	36 32%	413	22 21%
	task	529	61 01%	325 5	91 82%	1549	80 72%	533	63 68%	1446 5	77 79%
Team 7	Tot word	1691		1796		1981		1868		1410	
	name	437 5		435		67 5		425		315	
	subtotal	1253 5		1361		1913 5		1443		1095	
	process	163	13 00%	318	23 37%	29	1 52%	94	6 51%	0	0 00%
	task	1090 5	87 00%	1043	76 63%	1884 5	98 48%	1349	93 49%	1095	100 00 %

Chat 6		Chat 7		Chat 8		Chat 9		Chat 10		Total Words	Total Percents
1211		1322		1303		2471		1635			
260		295		237 5		505		405			
951		1027		1065 5		1966		1230		14731	
12	1 26%	152	14 80%	282	26 47%	301	15 31%	77	6 26%	1302	8 84%
939	98 74%	875	85 20%	783 5	73 53%	1665	84 69%	1153	93 74%	13429	91 16%
1786		2989		2964		2024		1478			
402 5		647 5		652 5		617 5		392 5			
1383 5		2341 5		2311 5		1406 5		1085 5		15027	
282	20 38%	599	25 58%	199	8 61%	687	48 84%	610	56 20%	3454	22 99%
1101 5	79 62%	1742 5	74 42%	2112 5	91 39%	719 5	51 16%	475 5	43 80%	11573	77 01%
5820		4449									
1280		985									
4540		3464								19970	
1261	27 78%	773	22 32%							4437	22 22%
3279	72 22%	2691	77 68%							15532 5	77 78%
2262											
480											
1782										7926	
189	10 61%									401	5 06%
1593	89 39%									7524 5	94 94%
460		1213		1737		1650					
125		267 5		375		312 5					
335		945 5		1362		1337 5				8573	
127	37 91%	45	4 76%	119	8 74%	571	42 69%			1421	16 58%
208	62 09%	900 5	95 24%	1243	91 26%	766 5	57 31%			7151 5	83 42%
1874		2415									
347 5		477 5									
1526 5		1937 5								9301	
35	2 29%	783	40 41%							2272	24 43%
1491 5	97 71%	1154 5	59 59%							7029	75 57%
1990		1331		1042							
490		272 5		267 5							
1500		1058 5		774 5						10399	
344	22 93%	432	40 81%	37	4 78%					1417	13 63%
1156	77 07%	626 5	59 19%	737 5	95 22%					8982	86 37%

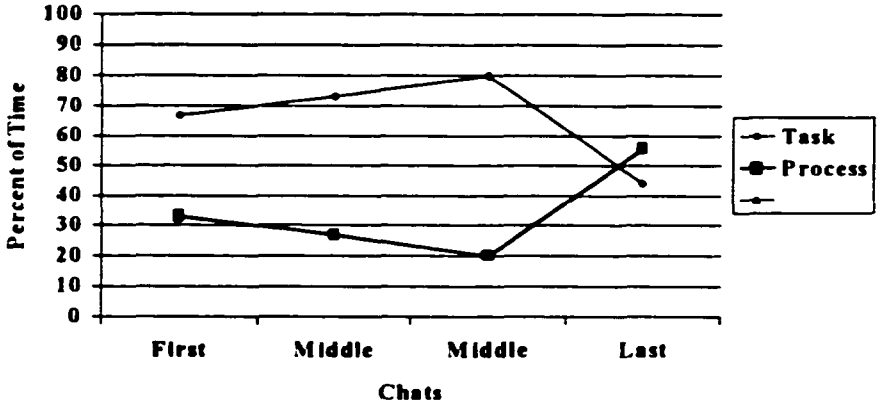
APPENDIX F

TASK AND SOCIAL COMMUNICATION FOR EACH TEAM

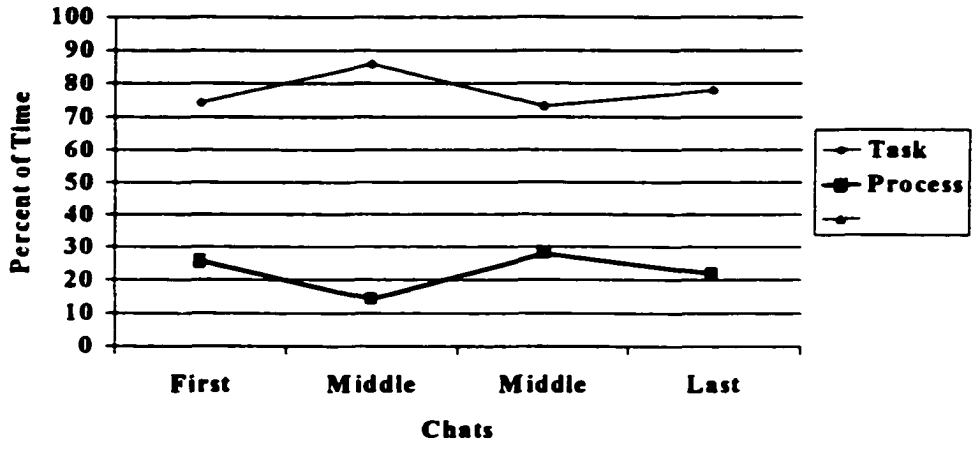
Team 1



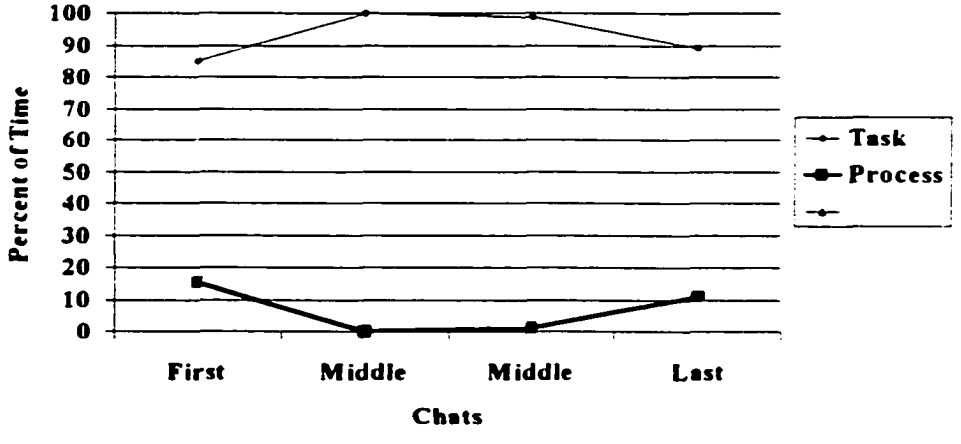
Team 2



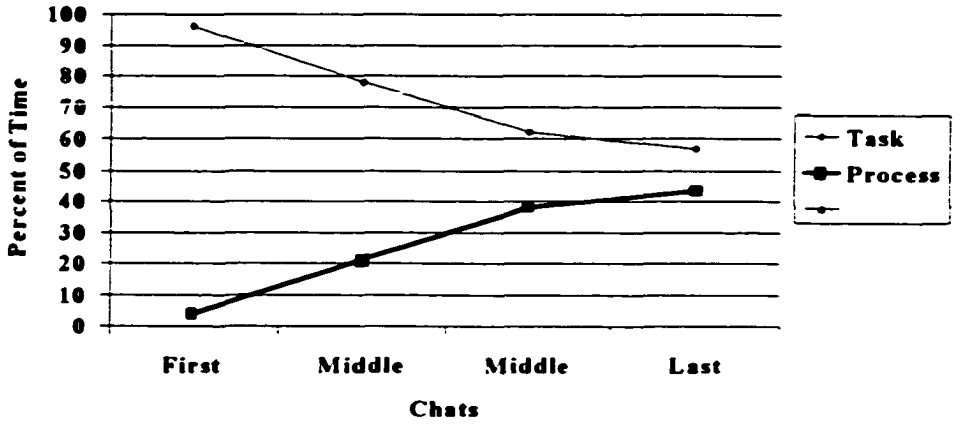
Team 3



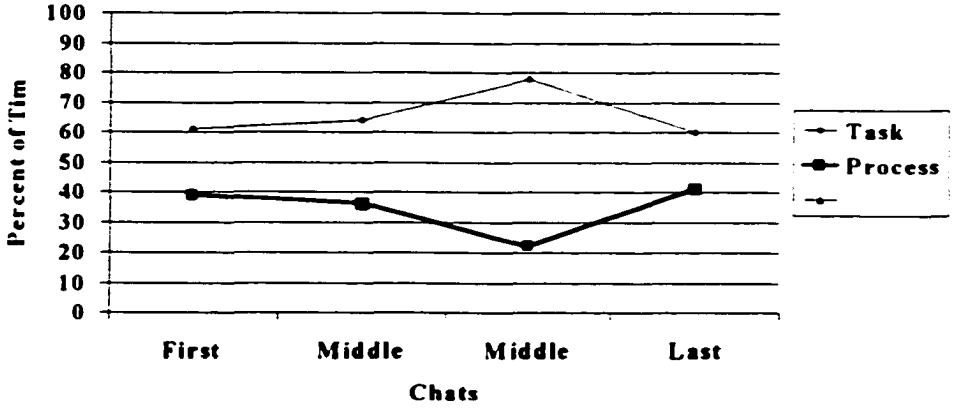
Team 4



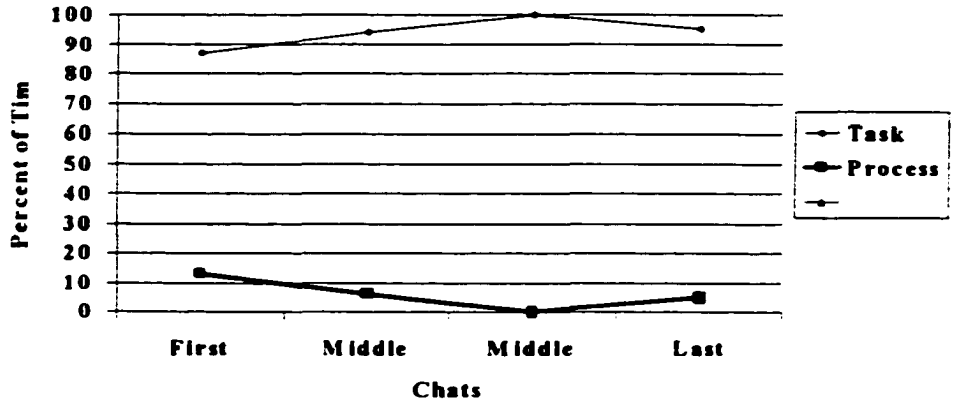
Team 5



Team 6

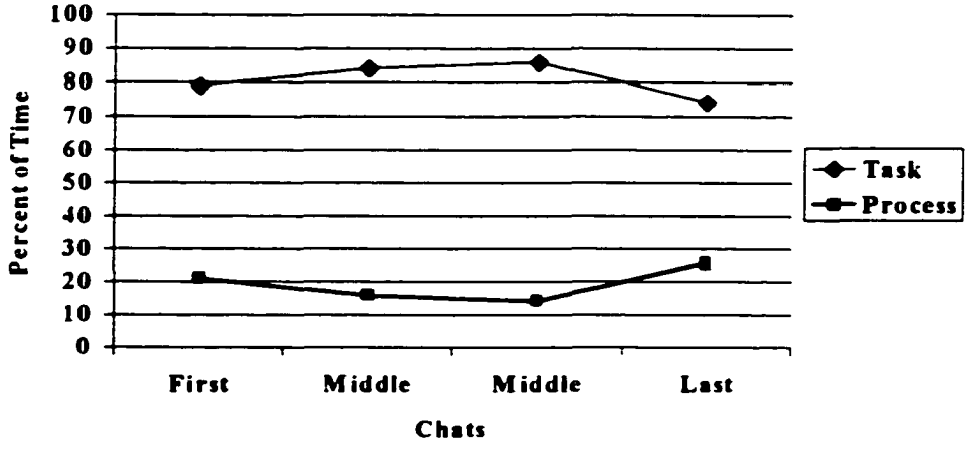


Team 7



Average of All Teams - First Middle and Last Chats

Task and Process Communication



APPENDIX G

TEAM DEVELOPMENT CODING FOR EACH TEAM

Team 1 – Team Development Analysis

Chat	Process	Team Development Stage
1	Get to know you Logistics – how to work together Timelines, dividing work Used decision process	Orientation/ Organization **Dependency – some, no leadership struggle or conflict** **Cohesion -evidence of "we" open sharing of ideas**
2	Agreed on co. to audit Discuss logistics of survey Volunteering Initiator role evident in 2 people Asked for everyone's opinion -	**Organization** **Open data flow** – easy flow of group discussion Task relevant information is openly shared **Collaboration** – group is not exhibiting strong cohesion (high interpersonal trust) but is also not exhibiting conflict and is not in dependency People asking for other's opinions, "are you OK with this choice" "Do we all agree with this co" People volunteering strengths
3	Short chat, new people join chat and are introduced, group members have not been keeping up with req. for proj. some confusion over who is doing what	**Organization** – roles being negotiated confusion, still determining how to work together, prioritizing tasks **Confusion** – some collaboration
4	Discuss customizing survey What is next on agenda Confusing chat, people not remembering agreements and who is doing what First example of non-verbals being communicated	*Organization* — roles being negotiated confusion, still determining how to work together, prioritizing tasks **Confusion** – *some collaboration*
5	Discuss how to administer audit and analyze data	**Organization** Coming out of confusion
6	Each person vol. for different parts of report A timeline has been prepared Summarized what each person is doing	**Organization** **Collaboration** – lots of thank yous, sharing communication style, asking for opinions, clarification, more use of summarizing
7	Discuss exam in 630- first time other topics discussed Discuss timeline and negotiated new dates	**Organization** – *some Open data flow* **Collaboration** decision making process used
8	Initiated agenda for this chat Discussed everyone's responsibilities Discussed writing and formatting guidelines	**Organization** **Some confusion** – people not keeping up with req. for proj. or reading email updates *Collaboration* – people vol. to cover for each other due to work loads etc more soc communication
9	Discuss length of report, how long each section is Confirmed who is writing what, agreed on due dates Discuss different ways to write up report	**Organization and Open data flow** – discussing different options for writing up report and presenting data **Collaboration** – decision making process, what can I do to help, what do you need, supporting each other moving toward cohesion "we are doing a good job" " this has been fun"
10	Discuss status of everyone's section Thank-yous, you are doing a great job Suggestions for changes to draft	**Open data flow** **Cohesion** – everyone seemed in harmony and agreement about status of report Positive comments about group process Enjoyed working with you moving toward Interdependence ??– honest feedback,

Team 2 – Team Development Analysis

Chat	Process	Team Development Stage
1	Get to know you, discuss cases Discuss # of team members - Decision process used Discuss chat times and due dates Discuss co. to audit Discuss – feeling overwhelmed	**Orientation** - unsure about task of the group **Organization**- roles are being nego. determining how we will work together **Introduction** – get to know you, do you know? **Collaboration** – decision process, what do you think
2	Discuss who to audit and how to do this virtually Discuss ways to divide up work Discuss how to administer and analyze data Made decisions Summarized and confirmed plans	**Orientation** **Organization** **Collaboration** – open sharing of ideas and discussing options, decision process How do the rest of you feel about this decision?
3	Discuss - admin survey Discussed who to include in audit – decision process used Summarized who is doing what so far Group support of each other "Good ideas and thank-yous" Group does a lot of summarizing of agreements and what each person will do probably prevents confusion	**Organization** **Collaboration**
4	Brief discussion of cases Update on status of audit Discuss – what is next step Discuss – how to tabulate survey responses Discussed – cases, videos, communication styles Emoticons used Warm, friendly good-by	**Organization** **Collaboration**
5	First 2 people at chat – social communication Discuss status report on audit Discuss – how to post and share survey data Volunteering to help Discuss – cases and next chat	**Organization**
6	Discuss – general survey results Discuss – what is next step Discuss – how to write up each section of report and coordinate with each other Discuss – can we meet timeline Reached agreement on how to write up each section and share what they are doing Reviewed req. for other assignments	**Organization** **Open data flow** – sharing ideas and sugg. for how to write up the paper – easy flow of group discussion on each issue **Collaboration**
7	Thank yous Discuss video presentation Discuss how to review report and give feedback Discuss writing recommendation vs. conclusions Confirmed agreements confusing chat, lots of problem solving in how to write report	**Open data flow** **Confusion** **Collaboration**
8	Discuss ways to review all versions of report and edit One person vol. to be final editor Discuss visuals for report Lots of summarizing agreements	**Open data flow** – not to problem solving yet – no real creativity, no diagnosing of task function (confusion) **Collaboration**
9	Much more social comm. Not all members are at chat and there are some comm. and concerns about this Discuss additional revising that needs to be done Thank yous	**Open data flow** **Collaboration**
10	Social com. about other classes, next semester Discuss sugg. changes and revisions Many thank-yous "It has been great to work with you"	**Open data flow** **Collaboration**

Team 3 – Team Development Analysis

Chat	Process	Team Development Stage
1	Discuss grades from last semester Discuss logistics for audit Suggestions for how to divide up work Lots of social comm Reviewed agreements	**Orientation and organization** – discuss project what is expected and how to organize work **Collaboration** group seemed to know each other, comfortable with each other, honestly exchanged opinions about classes and discussed personal information
2	Social comm. discussed how first case should be done Discuss adapting survey Discuss analyzing survey data Discuss how to divide up work D-sched and timeline for proj. – set dates confusing conversation – then "who is on first? where are we in this conversation" Call for a timeout – "everyone breath, need to regroup and get everyone on the same page" Group all took a breath – "ahhhhhhh" Nego when changed should be made – Discuss -deadline for each person's work Summ agreements D-analyzing data Q "How are we doing" "It's a wrap" personal comments – I have the flu – hope you are better	**Organization** **Confusion** conversation became very confusing and convoluted many conversations and topics going at once displays of frustration with confusing conversation – "I want to have a phone conversation " **Open data flow** some group members not comfortable with timeline – recog D's value – pushes everyone to get things done. **Collaboration** – moving toward Cohesion personal comments and soc. exchanges in 2nd chat. displayed emotion (frustration) communicated non-verbals
3	Social Comm – discuss grades on first cases, expressed frustration w/grading D-discussed survey questions and what needed to be modified; some group members expressed questions to each other I don't understand what you mean" "Here is my suggestion" Differing opinions, but "I'll support what the group wants" Confirm agreements D-how to transfer data from collector of surveys to data input person D-pros and cons of adding questions Agreed on changes Asked T – what else do you need "Thanks for feedback" Summarized actions that were agreed to	**Open data flow – Problem Solving** **Collaboration/ Cohesion** much more open exchange on what they think, offering different opinions, more like a discussion" than everyone offering opinion and decision made acknowledgement that people are stressed – group hug acknowledged different opinions asked what other think When a team member was quiet for awhile, someone would invite their participation- ask what they thought "Are we all OK with 5 pt. scale" "What do you think" "Here is my sugg" "That is a good pt" T-I'll play devil's advocate – go ahead – "It appears that I am the only one who cares about this issue – what do the rest of you think" "Other question" T leaves chat. "T is stressed" "Do we need a group hug" "A team hug – Yes"
4	D-ideas for dividing up work – De made sugg for how to divide up work, others agreed and volunteered for what they wanted to do D-"important that everyone carry their weight in getting their assignments done" D-how to analyze and graph data S-we need to talk about expectations for written report Soc. communication – travel plans etc D – brief timeline for completing project and need for more info from teacher on how to do proj. goodbys	**Open data flow** **Collaboration / Cohesion**

Team 3 – Team Development Analysis

Chat	Process	Team Development Stage
5	Discuss tech. problems - embanet D-general discussion of survey results that should be in report Sugg for chat agenda – we need to set up agenda for our meetings" Discuss- need to sched another meeting, not ready for tonight DE-"Can someone volunteer to assemble paper into one document "I can" – 2 vol. goodbys	**Open data flow** some confusion, but minimal **Collaboration** T-I'm stressed "Oh group hug time"
6	Discuss editing – doing it tonight not everyone has reviewed yet, should we wait until everyone has reviewed. – "let's discuss process, how to edit each section" Discuss need input from everyone Discuss how we should submit data Discuss use of # vs % Discuss how to write up findings, how to prioritize data Clarify next step – everyone will write their section and highlight 1-3 key findings Humor – TS volunteered to do everyone's work "think of your peer evaluation More sugg and then agreements on how to finalize everything Summ – everyone is not on the same page – so let's confirm format Discuss agree on next deadline and plan of action Let's recap – then "Let N finish" humor and personal conversation Discuss peer eval along w/ humor – bribes, $ and choc.	**Problem Solving** identify problems that are barriers to completing paper, identifying issues to improve team functioning **Confusion** confusing conv. 2 conv. going on at once. then DE says, Clarify two issues – use of graphics and writing reports there is some frustration as people are not clear on next steps **Cohesion** very honest feedback on writing – appeared to be accepted well this group does a lot more expressing of non-verbals in writing such as listening, waiting, breathing, etc frequently asked for everyone's input recognized when people were confused and addressed issue lots of fun humor, able to make fun out of the work they are doing – genuinely seem to enjoy joking and be obnoxious with each other TS – "I had a hard time following write-up, "Speak on TS" TS critiqued writing – provided honest feedback on other's work
7	personal discussions, D-paper format "I think the paper gets better each time we look at it" more personal conversation Discuss expectations of grader, prof, co, general agreement that paper is good Discuss who will do final pieces of paper –people volunteered others for jobs of they vol. themselves De-asked TS – do the results seem realistic to you given that you work for the org. – yes D-formatting each section – should all be formatted the same way Humor – we're losing it	**Problem solving** **Cohesion** people asked – are you doing too much are you ok doing this – genuinely seemed concerned about equally sharing work load. became a convoluted discussion lot of different discussions – most of them humor comments or obnoxious comments some off the wall comments about broad spectrum of topics examples of silly types of humor you might see in a meeting when people have been working too hard for too long – goofy humor.

Team 4 – Team Development Analysis

Chat	Process	Team Development Stage
1	Only 3 people at chat Social comm - case grades where are you from? "I look forward to working with you" Discuss process for completing audit Some vol. on what each would fo Agree on chat times	**Orientation** – expectations unclear. no goals **Organization** - beginning to prioritize tasks **Introduction** – where are you from there has been some email comm about what co to audit
2	Only 3 people in chat – 2 new people and one person from previous chat Disucss audit process. letter. handout surveys Discuss how to input data and analyze data Discuss-who is in group Discuss- how to divide up work Discuss-survey format and clarified ques on survey Sugg- "let's brief at milestones of proj" Q-how do we get the other 3 people working on this (those who were not at this chat) Summ – who is doing what at this point	**Organization** **Stuck** this (how to input and analyze data) was never totally agreed on and they were still discussing different ways to do this the night before the report was done **Collaboration** new person joins – "hope others join chat" but let's get started "Do you have any thoughts on how to delegate responsibility" "sounds like you can contribute in a big way" a few soc. comments – good luck on trip etc
3	Update on audit process "what can we be doing while we are waiting on surveys" Discuss - "What is division of labor" "I'll help wherever you need me" Thank-yous Exchanged phone # J will post messages once all surveys are returned reminded people to read postings to team folder	**Organization** very short chat – check-in only **Collaboration** - beginning "Thanks for agreeing to distribute the survey to your co. "Sure. got to help. was getting worried" (about getting project done) implication – because no one else was doing anything "at least we are all on the same wave length" so far – very short chats only 3 out of 6 people have been in each chat – this group seems to have a later start at proj and still does not have all members showing up for chats.
4	Four people attended chat Thank-yous to people for gathering data and setting up format for paper Discuss -ways to analyze data Discuss - division of work and who will coordinate all info Volun. of what people want to do. but this was not followed up on at this point Sugg – how to write up report Sugg – we each analyze a section of data and write up that info Summ of what sections of survey people have vol. to do Q-what date do we need data compiled by? Confirm who is doing what Confirm how to anaylze # Sugg – everyone post what they have written so they can review each other's sections	**Open data flow** – open exchange of ideas. critique of ideas. decision making process easy flow of group ideas **Collaboration** "anyone want to vol. to crunch #" "Can someone take charge of sorting all of answers and re-post" "great teamwork – let's do our sections but be aware of other section issues" everyone states what they will do by when a few personal goodbys – have a great weekend etc

Team 4 – Team Development Analysis

Chat	Process	Team Development Stage
5	Five people attended chat (1 still missing) Discuss - where is Anne, she has not been to a single chat - who will cover her section if she does not do it – P vol. D-still have a lot of work to do what has been done – what needs to be done Asked for vol for work that needs to be done Sugg – meet one more time to review Discuss-final details of pulling report together Discuss-executive summ, rec. concl Discuss-everyone should review report requirements and make sure they are following them	**Open data flow** critique functioning of the group "does everyone feel like they are getting a chance to contribute" P – "any concerns about our teamwork" P- "you are carrying quite a load" J-"good point – something else you want to take charge of" P – "I can do rough draft P-"I appreciate your hard work" J-"I guess I need to delegate more" **Collaboration** discuss how to cover section if one person does not complete, people easily volunteered -"J do you want to vol for transmittal letter" J "I will do trans letter" C-"I'll work on polishing the final report" B-"I will do trans. between sections" much warmer friendlier, more personal welcomes to the chat, plus everyone shows up at about the same time this team has had much less time in chats – much less discussion of all parts of report very little humor, social communication or get to know you information, did say thanks for hard work fairly often
6	Four people attended chat Brief hellos Agree that report reads well Discuss how to review report and make final changes and edits Discuss what else needs to be done – diff people vol for diff. tasks Disucss-whether report should include rec sure we agree on final product Discuss how to generate recommendations – should we post or vol right now Everyone vol rec. Sum – here is what is left to be done Many thanks to C for org report D- difficulties of completing MBA program	**Open data flow** **Stuck** – should report include recommendation or just conclusions – this is the 3-4th time this topic has been discussed **Collaboration** ½ page of soc comments for the first time J-we all contributed "Does everyone approve of text and edits so far? yes "I hope to see you all around in later courses –this is going to take me 4 years enjoyed working with you guys" Thanks for your hard work "Have a great night gentlemen" All teams seem to get stick in a loop on some topic that they continue to discuss but never resolve this team prepared an outline of the report at the very beginning of the project and it guided them in putting the report together it was prepared after the first chat

Team 5 – Team Development Analysis

Chat	Process	Team Development Stage
1	Get to know you, where are you from, who is in our group Discuss what co to audit One team member G. vol his org, and asked – is everyone ok with this, what are other options, all agreed Q- Who is team lead? Who wants to lead Discussed logistic of audit Sugg -"let's make time line for proj – not followed up on Discuss customizing survey Summ agreements Discussed meeting schedule G- will revise survey, and post for comments	**Orientation** new group, but most were familiar with chat concept. some had been in classes together before Get to know you **Organization** Chose a group to audit, discussed logistics **Introduction** get to know you **Collaboration** examples of people inviting others to participate in the chat discussed options for audit project and easily agreed on decision only group to ask about who wanted to be team leader, although it was never confirmed who was team lead. freq. asked – Is that ok with everyone offers to help - very concerned about one person doing too much work "G, it appears that this is a lot of work for 1 person, are you sure you are OK with doing what you have committed to" "let us know what you need" personal goodby "I look forward to chatting with you on Thurs.
2	Greetings – social communication about video project Discuss-should there be a comments section on survey – discuss pros and cons of comment section Discussed -customized survey, does everything look ok Discuss -org. and mgt structure of co. Vol – people vol. for different parts of project D-next meeting time	**Organization moving Open data flow** prioritizing tasks, many offers for help suggestions made easily, evidence that they trust each others work **Collaboration** checking again –are you OK with workload many thank yous to G evidence of several communication roles initiating role, refocus role rotates among group members although primarily 2 people assume this role We have four weeks to get this done "This is a good team" this statement made fairly frequently and often during this group's chats positive comment about team early
3	Greetings - ½ page of personal chat waiting for others to show up, what other classes are you taking, some humor, "what do we need to do tonight" "sleep" Discuss audit status	**Organization** **Collaboration** "Thanks for coming to chat" "G, again – great job" Discuss next meeting time "I like your meeting style, short and to the point personal goodbyes – "get some rest"
4	Only 2 people initially – personal comm. since no one is here when is next meeting Discuss audit update update – only 21 surveys back so far – discuss how to get surveys inputted into excell missing part of this chat	**Organization**

Team 5 – Team Development Analysis

Chat	Process	Team Development Stage
5	Greetings – how was your video, how did you do it "have you seen tape with audit instructions" she gives an overview of her expectations D-of who will do what at this point – data is not yet available "Next week we need to rip this thing off" "Someone needs to be final editor" – M vol to edit Discuss easiest way to crunch numbers Goodnites – shall we call it a night, always fun	**Organization** Asking for volunteers to do different parts of project **Collaboration** very congenial group, lots of thank yous and ensuring that everyone is participating in chat
6	Greetings -Hello, when do you plan to finish MBA – all vol. dates "have we assigned people to diff parts of report yet? – no personal discussion, wisdom teeth out, etc "hope you are not feeling too bad" Discuss who will do what D-31 surveys returned, data will be posted tonight some vol. to write different parts of report missing part of chat	missing part of chat team development not evaluated for this chat
7	Greetings - Hello, discuss who has taken final, when they will take final Discuss - what still needs to be done Ask individual people what they want to to do "F-what do you want to do" "I can do concl. and summary Disucss -review paper's req. and what is written so far Disucss-what needs to be done for appendix? M-I will start combining things and editing so a paper has a common voice. Q-when can each person post their work? Summ – what is left to do D-next meeting time Summ – timeline for the next few days Goodby –	**Organization/Open data flow** use first initial of first name to greet each other and refer to each other F-is fairly quiet in chats and has missed some chats **Collaboration** J- "F are you still with us" "Can everyone support Sat deadline? Personal good-by – have fun this weekend, thanks, have a good night Several people ask others to review their work and make comments appears that one person, G, took significant lead and did a lot of the work not as much joint problem solving – one person assumed leadership role and became more directive
8	Discuss- difficulty of getting on embanet Discuss-status of report "looks like report is coming together" "all the parts of the project look good" Discuss-exec. summ. some confusion about what should be in it, how long it should be, etc – agreement that exec. summ needs to be changed Discuss-what information goes where and "What do we need to finish up" Summ- what needs to be done Sugg – review rec. before next meetings "you guys are great" Discuss -case 5	**Organization/ Open data flow** (small) "just checked the req. list, we have all the pieces" **Stuck** group got a little stuck on what exec. summary needs to be **Collaboration** gave fairly honest feedback to each other on each other's work did not get paper done, I broke my foot yesterday "Are you feeling ok, can you still do this (I hope)" D-medical problems a couple people are dealing with

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Team 6 – Team Development Analysis

Chat	Process	Team Development Stage
1	*(not all team members are present)* Hellos, where do you work, where is everyone, with distance education program it is hard to get everyone together Suggestions-for a company to audit, sounds good Discuss some personal information, married? do you have kids?	**Orientation** **Introduction** More social communication seems to happen when there is a smaller group on line – for example when people are waiting for others to arrive at the meeting
2	Brief discussions about what to do, suggested process for completing audit.	**Orientation** (not all team members present, others are hesitant to make decisions without them) Expressed feelings that they are getting behind because they have not started on anything **Introduction**
3	Hellos Survey has been completed need to send it to whoever is going to analyze data Discussed update on survey U-vol to compile data Some discussion about survey results Discussed information about the company Discussed communication in the organizations that they work for Discussed next chat time	who is going to do what is decided by email **Orientation/Organization** **Introduction** a lot of social communication Discussed their own jobs and what they do- do they like it Discussed communication styles of different group members one individual initiates most of the social communication
4	Discussed- where is everyone, I have a lot of other things to do- D-results have not been sent to the person who will analyze data – the results have been done for a week but have not been sent out. There is a lot to do and no one is coming to chats While waiting for others to arrive they discuss BG 630 exam Da- posted what everyone is doing in email Discuss video presentation	some frustration displayed because people are not showing up in chats (yet they gave everyone 100 % on peer evaluations) **Organization** **Introduction** **Confusion** Confusion on who to send surveys to and who is inputting numbers
5	Hellos, social communication Discuss what is not done "Can we finish this thing, only one week to go" Discuss requirements for project Discuss "who is pulling this together" Sugg for writing up report Discuss who will vol. to pull project together -Da vol to edit and org. final report Discuss case grades Discuss when does Da need everything Discuss what should we be looking for in survey results Discuss next chat more personal goodbyes	One person, Da really wrote the whole report, some others reviewed the numbers and made sugg as to what were sign findings. This is a different approach from the other groups **Organization** spent most of their time discussing what to do next, who would do it. No real discussions and problem solving **Introduction / Collaboration (small)** comment – "I don't want to leave you with too much work" – "writing isn't hard for me, I like to do it" "We have our marching orders"

Team 7 – Team Development Analysis

Chat	Process	Team Development Stage
1	Discuss time zones, not read all bios, how to do this in virtual environment Discuss who to audit, one person volunteered their company- all agree Discuss survey process some soc., I'm from Boise too Discuss how to divide up work	**Orientation** discuss how to do this task in virtual environment **Organization** Moved into discussing survey process, making decisions about who would do what **Introduction** get to know you, where do you work etc **Collaboration** made decision easily about who to audit, people very willing to agree "glad to be on team with you guys" not evident at all that this is a new team, I thought they had worked together before by the tone of the first message, but later they state that they are a new team
2	Greetings, thanks for vol. your co. Discuss how to complete proj general discussion that people at T co. appear to be supportive of survey. Asked for vol. to input survey results Asked for someone to list steps needed to complete proj. Vol – people vol ideas about what needs to be done and then People vol. for different tasks the absent team member is also assigned tasks Discuss how to access survey results – so everyone can acesss data Discuss video pres. Discuss next chat time	**Organization** discussing who will do what, logistics **Collaboration** "hard to believe we are a new team – we're rolling along smoothly" Easy conversation about volunteering for different aspects of report – people vol and ask others to volunteer for different tasks more personal conversation very personal goodbyes easy conversation, very comfortable, one team member uses humor, more personal communication from the beginning, does this encourage others to be more personal?
3	hellos – sorry I missed last week "I have had it with this assignment" – people were not returning surveys and person was very frustrated. D-how to get rest of surveys returned D-how to divide sections and work – this is brought up several times in this chat Some confusion on who is doing what Clarify who is doing what "What else needs to be assigned?" "What else should we do – sugg – do a list of tasks and assign names (for about the 3rd time) agreement to do this people state preferences someone vol to summ all agreements "we now have a plan coming together" D-timeline confirm next chat time	**Organization/ Open data flow** most of chat time is spent discussing what needs to be done and who will do what critiquing group process – Open data flow Comments – it is hard to make decisions this way" referring to the vir. environment "But – things were flowing so well before" **Confusion** they list what needs to be done twice- but it is not assigned, convoluted conversation, some volunteering but not clarified or confirmed at this point having a team leader or someone in charge of this chat would have helped them to sort this out more quickly **Collaboration** easily discussed options for dividing up work expressed frustration – others quickly asked how they could help "T- bad day?"

Team 7 – Team Development Analysis

Chat	Process	Team Development Stage
4	hellos. discuss kids, what ages each person's kids are D-problems reviewing survey results "Any comments on the letters I wrote" Discuss-letters, trans, thank-you etc. What needs to be done next? "Discussing findings will be fun" Discuss some of the survey results everyone is to post ideas about common themes in the results and P will summarize them	**Open data flow** Discuss survey results and how to write up results . decision making process Discuss ideas and sugg on how to review survey results, analyze results and write key findings **Collaboration** first example of dec making process sugg made, another sugg, refining first one is made – then everyone indicates support. Asking for feedback on work done Summ – is everyone clear on where we go from here
5	Begin with lots of soc. comm. for about 1 ½ pages - discussed other classes, missing living in Denver, what do you do "What are we going to discuss this evening" intro is good. ask for clarification – how are we pulling the report together – this is from the person who said he would summarize the info everyone posted J vol to pull paper together Discuss-length of paper, some humor Discuss due dates for different aspects of proj. and time line Discussed- how to discuss some of the results P-vol to summ the agreements made in this chat on who will be doing what What grade do we want to get? – agree on A	**Confusion** appears people are not remembering items from the last chats, what they agreed to etc. **Open data flow** only group to discuss all of survey results in their chat – other groups had each person write up a section of the report and then discussed conclusions and rec. **Collaboration** only group that discussed goal – what grade do we want to get "Is there agreement on timeline? People confirm that sugg due dates are ok "Are you happy with results?" directed to person who did survey on her co. "this team ran smoothly if you ask me" fairly early discussion about team process, other groups did not comment on team process until the final chat.
6	Discuss virus in some of the files Discuss who is mailing final report – will follow timelines set, rec. almost done "When does everything need to be done" Discuss timeline for the rest of this week review who is doing what Ask for phone # in case they are needed for last minute ? Confirm when updates will be done reminded people to give inputs by Friday	**Open data flow** **Collaboration** Appreciation for work done
7	Updated report is posted "Did you review my comments" wrong rec initially included – now the correct ones are there "Current report looks good but need to review again Discuss final exam personal conversation – where do you live, what do you do, where else have you lived (2 pages)	the personal conversation took place as 2-3 people were waiting for others to show up in the chat – would this much personal info have been exchanged if they had not been waiting for others to show up? Mostly social communication, get to know you information as they waited for others to arrice

Team 7 – Team Development Analysis

Chat	Process	Team Development Stage
8	Discuss - final copy looks great Sugg for changes to final report - people sugg different things that needed to be changed to final copy – such as p #. toc not totally correct, is summary in the right place, headings OK? mostly formatting errors. "I'll repost final with changes	this is group's last chat but there were no conversation about this being the end no "nice working with you, congrats on a good job" no goodbyes because this is the end of the project, no see you next semester etc. **Open data flow** **Collaboration** great going, nice job, "WE did it!!" some thanks, great going, etc. "super, thanks, bv"

Summary of Team Development for each Team

Team	Chat 1	Chat 2	Chat 3	Chat 4	Chat 5
1	Orientation/ Organization Introduction/ Collaboration	Organization/ Collaboration	Organization Confusion	Organization Confusion Collaboration	Organization leaving confusion
2	Orientation/ Organization Introduction/ Collaboration	Orientation/ Organization Collaboration	Orientation/ Organization Collaboration	Organization Collaboration	Organization Collaboration
3	Orientation/ Organization Collaboration	Organization Open Data Flow Confusion Collaboration	Open Data Flow Collaboration/ Cohesion	Open Data Flow Collaboration/ Cohesion	Open data flow Collaboration
4	Orientation/ Organization Introduction	Organization Stuck Collaboration	Organization Collaboration	Open Data Flow Collaboration	Open data flow Collaboration
5	Orientation/ Organization Introduction/ Collaboration	Organization Collaboration	Organization Collaboration	Organization	Organization Collaboration
6	Orientation Introduction	Orientation Introduction	Orientation / Organization Introduction	Organization Confusion Introduction	Organization Introduction
7	Orientation/ Organization Introduction/ Collaboration	Organization Collaboration	Organization/ Open Data Flow Confusion Collaboration	Open Data Flow Collaboration	Open data flow confusion collaboration

Summary of Team Development for each Team

Chat 6	Chat 7	Chat 8	Chat 9	Chat 10	Team
Organization Collaboration	Organization Collaboration	Organization Confusion –s Collaboration	Organization/ open data flow Collaboration	Open Data Flow Collaboration	1
Organization/ open data flow Collaboration	Open data flow Confusion Collaboration	Open data flow Collaboration	Open data flow Collaboration	Open data flow Collaboration	2
Problem Solving Confusion Cohesion	Problem solving Cohesion				3
Open data flow Stuck Collaboration					4
	Organization/ open data flow Collaboration	Organization Stuck Collaboration	Organization Collaboration		5
Organization/ open data flow Introduction Collaboration s	Organization/ open data flow Collaboration	Organization Collaboration			6
open data flow collaboration	*all social comm*	Open data flow collaboration			7