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**THE EFFECTS OF WORKPLACE INTERNET-BASED COMMUNICATION
CHANGES ON A UNITED STATES NAVY OFFICE: A CASE STUDY**

by

Edward Allen Callaway

A Dissertation Presented in Partial Fulfillment

Of the Requirements for the Degree

Doctor of Philosophy

Capella University

February 2003

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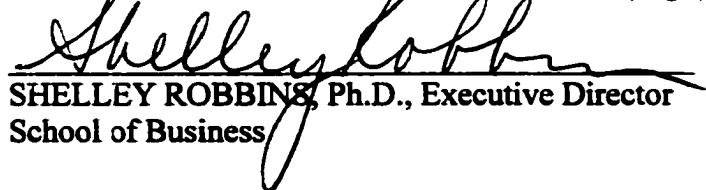
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Abstract

The United States Navy office that was studied is a virtual organization that uses its network of other organizations to accomplish its work. It experienced a loss and restoration of its Internet-based communications for approximately five months. The study resulted in a set of 23 different effects, which are the outcome of the actions taken by the people in the office to accomplish their work in the face of this disruption. In addition, the study contains a series of conclusions. The primary ones relate to the group's success in continuing to meet customer needs despite the disruption and that this success was predicated on the organization's structure as a network. Other conclusions relate to a paradigm shift on the part of the participants, a change in organizational identity, change management, management's role in the process of restoration (in particular), and the use of instant messaging as a work accomplishment tool. Finally, the study suggests that no individual or organization ever intentionally or unintentionally lose its Internet-based communication, especially for purposes of research. It continues with further research suggestions in the areas of networks, an office's performance, management's role in a virtual organization of knowledge workers, and people-related matters, such as paradigm shifts, their determination to succeed, and identity. Some methodological recommendations are made as well.

Dedication

This dissertation is dedicated to my wife, Dawn, who is “the wind beneath my wings.”

Acknowledgements

The first and, perhaps, the most important acknowledgement is my God. I must acknowledge that, without God's calling, I would have structured my life differently, I would not have entered the Capella Doctoral Program, and I would have a different point of view on many things. From the time I accepted God's call at age 19, my life has been a series of blessings that simply cannot be counted.

I believe that it is crucial to acknowledge my wife, Dawn, and my daughters, Christine and Meredith, for their unflagging support during all my forays into structured learning situations, including this dissertation. I am so blessed to have these people in my life that I cannot express it. We have accomplished so much together because there is so much love, support, and assistance in our family.

Dr. Norman Pearson was my Mentor and Committee Chair. It is simply insufficient to say "Thank you." Alternatively, it is impossible to describe the many ways in which he has been a friend, confidant, problem solver, helper, and coach as I worked through all my courses, Comprehensive Questions, dissertation proposal, and the final dissertation. I hope that he has enjoyed our conversations as much as I have and that he has benefited from them as much as I have.

I want to thank and to acknowledge the five persons who serve on my Dissertation Committee. They have been a significant help to me in focusing this dissertation. My Mentor, Dr. Norman Pearson, has been a source of constant support, ideas, and focus. My Learner Peer, Ms. Marilyn Cobb Croach, has provided unlimited support, friendship, and prayer, especially

during the last several months when the “tough got going.” My Visiting Scholar, Dr. Tammy Shapiro, focused me on my coding and data analysis process in this dissertation. My Faculty Evaluator, Dr. Johnny Morris, was a source of support when he kept focusing me on the matter of my work’s applicability and my life’s next steps. Finally, my Independent Faculty Reviewer, Dr. Bruce Francis, challenged me to “behave like a Doctor and speak with the courage of my convictions” and to have complete clarity on the critical aspect of a study’s trustworthiness.

I acknowledge the study’s participants—those persons in Acquisition and Business Management as well as the Strategic Business Management Division—who took their time, trusted me, and shared something of themselves in order to make this dissertation occur and to make my dream of being a Doctor a reality.

I want to thank Ms. Elaina Loveland, my Editor, for helping me through the process. Her knowledge and attention to detail made the editing journey easier for me. She was very effective in working virtually as we exchanged drafts and ideas. Most importantly, though, she was always cheerful and responsive to my schedules and its changes.

I know that it is important to acknowledge Reverend Larry R. Thompson and Reverend Denise P. Bates of St. Paul United Methodist Church in Woodbridge, Virginia. In their Sunday morning sermons, they have been the voice of God saying, “Get finished with the dissertation. I have plans that only you can fulfill.”

I must acknowledge my father, Edward Allen Callaway, who was a teacher and from whom I learned so much, even though he passed away so long ago.

I acknowledge my mother, Florence Mae Callaway, who recently passed away so that she cannot see my victory. Her contribution was the constant belief in me that “you can do anything if you put your mind to it.”

Returning to the beginning, I acknowledge my God as a prime force in my life and wonder what God wants me to do with my years as “Doctor Ed Callaway.”

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CHAPTER 1. INTRODUCTION

Introduction to the Study

This study concerns the effects of a loss and restoration of Internet-based communication on the results of one particular office. This chapter provides a context for the study by presenting a very brief history of the Internet, including a few current statistics on individual and business Internet usage, naming two aspects of Internet communication that are central to its effective use, and suggesting a few issues that must be addressed in the future.

A Very Brief History of the Internet

A Few Historical Facts

DeConti (1998) highlights some of the key aspects of the Internet's history. She indicates that the Internet's origin is found in Cold War research begun in 1969 by the United States Department of Defense Advanced Research Projects Agency (ARPA). Its objective was to "construct a communications network able to withstand disruptions that would take place in the event of nuclear war" (p. 5). Another purpose, as Charles M. Herzfeld (the former director of ARPA) stated, was to reduce the frustration caused by having a limited number of large, powerful research computers in geographic locations different from the researchers who needed to access them (Bellis, unknown, para. 3).

This ARPANET network provided four basic network services: electronic mail (e-mail), remote access (Telnet), file transfer (FTP), and news (Usenet). Access was generally free because the network promoted education and research activities. Over time, the transmission rate speeds increased to 45 megabits per second.

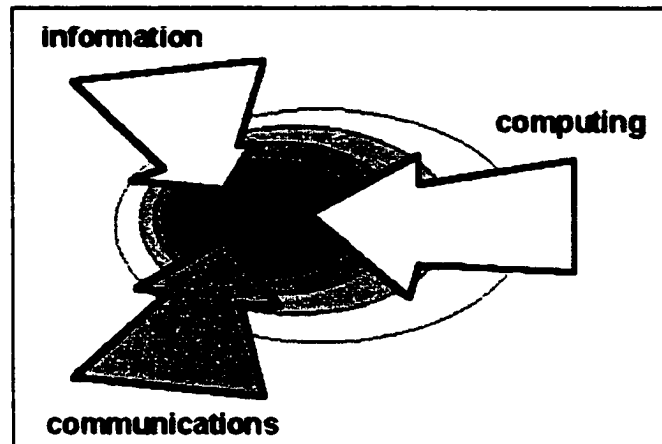
In 1995, federal support was withdrawn and commercial telecommunications providers began to provide the connections needed for the Internet operations.

Some Implications

From this historical background, it is important to consider some key factors about the Internet's growth, which are its

1. Flat fee policy, which depends on the maximum transmission speed. In the case of modem users, charges may be based on the amount of connection time.
2. Ability to link physically dissimilar networks.
3. Role as the world's *de facto* electronic mail system.
4. Use of public domain protocols (standards) that are universally supported by manufacturers.
5. Growing acceptance by mainstream business and society (for example, use of .com and .edu domains).
6. Two-way communication, whereby one can be both an originator and a consumer of information.
7. Ability to realize dramatic gains in the functionality of existing computer systems (DeConti, 1998, p. 6).

The United States Department of Commerce (n.d.) created two very simple models of the digital economy. One is consistent with the material noted above and shows the Internet as the center of convergence of computing (especially ubiquitous personal computers), communications, and information (para. 1). Figure 1 illustrates this model.



(Source: U.S. Department of Commerce, n.d.)

Figure 1. Convergence of computing, communications and digital information.

Summary

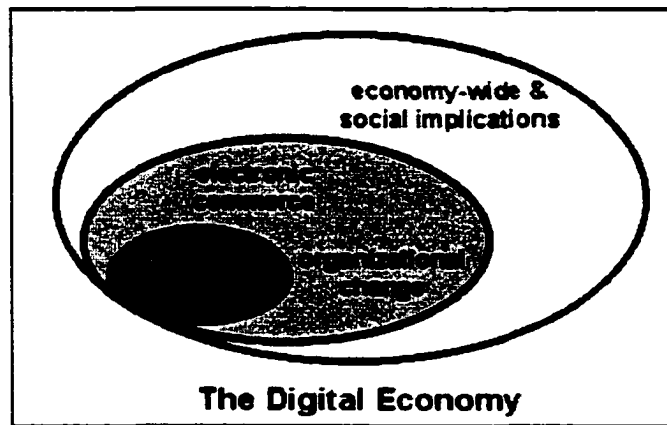
These facts show the importance of the technological changes of computer file sharing and communication connections. These changes allow persons to change (or to supplement) their communication modes and to exploit (individual and business) opportunities (Rogers, 1995, pp. 5–6; Mesthene, 1970, p. 28–29; Lauer, 1991, p. 170–171; Harmon, 2001, p. 8). Having adapted their communications methodologies, communication loss and restoration as described above, becomes serious and potentially devastating.

Some Current Internet Usage Statistics

A Framework

The U.S. Department of Commerce's (n.d.) second model (Figure 2) highlights how the Internet has become a "direct driver of changes in commerce and in firm structure and operations" (para. 2). In addition, it shows the "broader social and economic implications." While this change progression is not linear and these changes will have long-term social effects,

“the underlying phenomena of technological and market convergence...will continue to play out in ways that are difficult to anticipate” (para. 3).



(Source: U.S. Department of Commerce. n.d.)

Figure 2. The digital economy.

Some Current Statistics

With this general philosophical background, the U.S. Department of Commerce (2002) has statistical data that report actions that individuals and businesses have undertaken in their exploitation of opportunities, as noted above. For example, it reports

1. “More than half of the nation is now online. In September 2001, 143 million Americans (about 54 percent of the population) were using the Internet” and “174 million people (or 66 percent of the population) in the United States used computers” (p. 1).
2. “Ninety percent of children between the ages of 5 and 17 (or 48 million) now use computers” (p. 1).
3. “Computers at schools substantially narrow the gap in computer usage rates for children of high and low income families” (p. 1).

4. "While 80 percent of Americans access the Internet through dial-up service, residential use of broadband service is rapidly expanding" (p. 2).

5. "Forty-five percent of the population now uses e-mail, up from 35 percent in 2000. Approximately one-third of Americans use the Internet to search for product and service information (36 percent, up from 26 percent in 2000)" (p. 2).

6. "The presence of someone who uses a computer or the Internet at work in a household is associated with substantially higher computer ownership or Internet use for that household, by a margin of about 77 percent to 35 percent" (p. 2).

These conclusions were reached on the basis of U.S. Census Bureau's September 2001 Current Population Survey (CPS) of approximately 57,000 sample households. The survey took place during the week of September 16–22, 2001 and generated response rates of 93.5 percent for the basic CPS and 92.1 percent for the Internet and Computer Use Supplement.

Turning to American businesses' activities, Buckley and Montes (2002) report

1. "More and more individuals, businesses, and government agencies are using network technologies to connect with each other in an ever-growing number of ways for an ever-expanding number of purposes." For example, many firms reported using their computer networks for e-mail communication with vendors and customers, accepting orders online, as well as making online purchases (p. 17).

2. "Many businesses have only begun to exploit their IT investments by moving their business processes online and the network economies associated with the Internet's growing ubiquity should continue to increase its value to users of all types" (p. 9).

3. High-speed [data transmission] technologies, such as fiber optics, are not distributed throughout the networking infrastructure, creating transmission bottlenecks. However, alternative technologies (such as cable and broadband wireless, e.g., satellite and “fixed-wireless”) are appearing, which address the need to send large amounts of data quickly (pp. 19–20).

Summary

These examples illustrate the significance that the Internet and computer usage has in modern day America.

Two Critical Elements

The aforementioned information highlights two critical elements of the Internet and computer use—access speed and availability on a 24 hour per day and 7 day per week (24x7) basis.

To access the Internet, people must use a communications medium (Black, 1994, p. 367). The communications-connecting device (e.g., dial-up modem or cable modem) and service provider capability (e.g., digital subscriber line or T1 line) drive access speed. Further, they need 24x7 availability to allow them to do what they want when they want to do it (Sara, 2000, p. 280). For example, Comcast (2002) advertises its High-Speed Internet Pro by claiming that uploads are made at 3.5 megabits per second and downloads at 384 kilobits per second as well as “You’re always connected, you won’t even have to wait to get online. You’ll just wake up, turn on your computer and get to work.”

Societal Future

The U.S. Department of Commerce (2002) takes a positive view of the Internet and computer use adoption rates it reported. The Department states that the trend of increased computer usage "is enriching our world, facilitating our work lives, and providing a skill set needed for a growing economy" (p. 93).

Yet, with this benefit, there are concerns that need to be addressed. For example, Bruce P. Mehlman (2002), Assistant Secretary for Technology Policy at the U. S. Department of Commerce, outlined a number of challenges, which face governments worldwide. He raises issues of:

1. Protecting privacy when data is easily captured, manipulated, and transmitted.
 2. Ensuring security in the face of distributed and multinational hackers.
 3. Pursuing law enforcement when wrongdoers live offshore or hide behind sophisticated technologies.
 4. Minimizing digital disparities among persons and groups.
 5. Protecting intellectual property rights in an online world of peer-to-peer technologies;
- and
6. Addressing technology advancements such as nanotechnology, the human genome, and hydrogen free cells (para. 14–22).

Similarly, Gualtieri (1999) also raises issues that must be addressed. For example, in an assessment of the emerging information society on policy development and democratic quality, he raises issues of participation, accountability, credibility, freedoms of expression and association as well as the treatment and role of minorities, among other things. He, more or less,

concludes that the results of information communication technology usage and its impact on politics are unclear. Specifically, he determines that “the growth of the Internet and the IS [information society] is a threat to representative democracy.” But, he also concludes “It is *possible* [emphasis in the original] that as citizen access to and use of the Internet continues to grow, politicians could become more motivated to take into account its growing political force and adjust their approach to policy development to better exploit the Internet’s potential for sharing of information and consulting with the public” (p. 52).

Summary

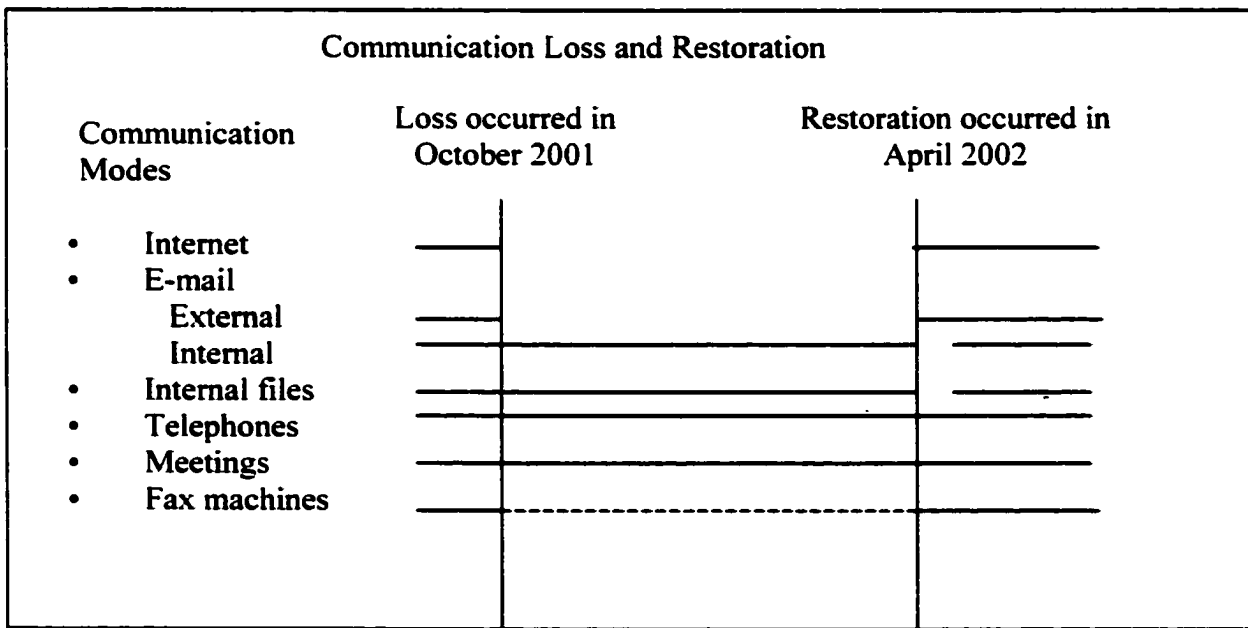
This Introduction covers many issues and provides examples as it establishes the foundation for this study. Specifically, it provides a very brief history of the Internet, outlines some examples of current individual and business Internet usage, delineates the need for high-speed communication access and availability to maximize the benefits of Internet usage, and shares some ideas of our society’s future as it moves forward with this significant addition to the world’s communications infrastructure.

Background of the Study

The Strategic Business Management Division

The Strategic Business Management Division was located in the Office of the Assistant Secretary of the Navy for Research, Development, and Acquisition. It reported to the Deputy for Acquisition and Business Management, who was responsible to the Assistant Secretary. This organization structure was valid during the time being studied. Subsequently, a reorganization changed the mission, function, and Deputy’s title to Deputy Assistant Secretary of the Navy for Acquisition.

On approximately October 28, 2001, the Strategic Business Management (SBM) Division lost its Internet and external e-mail communication, though it continued to have its internal network communication. Nearly six months later, on April 1, 2002, the Division regained its Internet-based communications, however, it lost its internal network communication. On April 26, 2002, these latter communications were restored; therefore, the division regained full communications. The fax machine was inoperable during much of this period because the Division Director used this telephone line for her external Internet-based communication. As shown as Figure 3, none of the other communication modes were affected.



(Source: Callaway, 2002)

Figure 3. Time line for SBM’s communication loss and restoration

The researcher was one of the people working in the SBM Division during the time frame and was directly affected by the communication loss and restoration. As such, the researcher is

an informed participant observer. This situation caused the researcher to become fully aware that the need for continuous Internet-based communications for organizational effectiveness and its impact on virtual organizations are little understood. He undertook this study with no particular point of view to support or personal bias—he simply wanted to understand the effects experienced by the persons in this Division. In view of the urgent events of the war on terrorism, research on this phenomenon is needed to understand more fully the consequences of the communication loss and restoration.

This dissertation relates to that communication loss and restoration, its effects on the organization, and organizational results.

The SBM case outlined above may seem unique, of a small magnitude, and therefore, not particularly significant. However, a communication loss and restoration recently occurred within the United States Department of the Interior with different causes and with significantly more dramatic effects. Below is a discussion of the situation according to Friel (2002).

The United States Department of the Interior

On December 6, 2001, the United States Department of the Interior disconnected all of its computers from the Internet. This action covered all the computers in its headquarters, its 14 bureaus, and its offices nationwide. A United States District Court judge directed this action because the Department's computers had no computer security, which played a role in an ongoing suit related to Indian Trust Fund mismanagement. The Department concluded that its disconnection action was the only way to meet the judge's requirements since all of its computers were deeply interrelated to one another.

The restoration process was complicated. Internal e-mail systems were not affected and continued without interruption. In addition, employees could reach those internal Web pages that continued without interruption. The United States Geological Survey and the National Interagency Fire Center regained their Internet connections on December 8, 2001. Most of the remaining Bureaus regained their connections in February 2002. However, in April 2002, the Departmental headquarters, the Bureau of Indian Affairs, and a few scattered Departmental systems were still not restored.

Some of the significant consequences to this Internet communications loss were

1. The Fish and Wildlife Service suspended investigations involving illegal wildlife trafficking.
2. Law enforcement officers lost online access to the Federal Bureau of Investigation's National Criminal Information Center.
3. American Indians waited months for royalty payments.
4. The Navajo tribal government had to provide about \$500,000 in temporary assistance payments to tribe members.
5. The Department's contracting officers could not directly access the FedBizOpps site, which provides announcements of Departmental contracting opportunities.
6. The public was not able to provide comments on proposed rulings quickly or inexpensively. The e-mail process used by some advocacy groups changed to a fax process, with the attendant price increase from \$0.01 per e-mail to \$0.25 per fax.

7. Employees used phone calls, faxes, mail, face-to-face interactions, handheld computers, work from home, hand-carried documents, and facilities from other agencies and contractors to accomplish their work.

Perhaps the most moving story of all belongs to the Minerals Management Service (MMS). It collects approximately \$8 billion per year from mineral leases on government and Indian lands. Nearly 10,000 Indian landowners receive checks for the minerals on their lands. MMS took to heart all the discussions concerning e-government and business process reengineering and accomplished the following: it reengineered its processes; placed the payment system completely online; discontinued taking paper submissions; and restructured its workforce in-line with the new system. The communications loss prevented MMS from providing the required information to the Bureau of Indian Affairs for payment authorization. As a result, no payments were made to the Indian landowners until payments were manually estimated and made in February 2002.

The Two Situations' Importance

These two situations illustrate the importance of continuous Internet-based communication and the importance of disaster recovery plans, including alternative work accomplishment arrangements. Ultimately, the situations illustrate the effect that information technology has had on organizations and serve as a warning to leaders to ensure that their organizations are ready to handle any events that could significantly disrupt their operations. The illustration shown above does not clearly demonstrate any organizational effects of the loss and restoration of communications. However, learning about these effects in the first situation is the purpose of this dissertation.

Organizational Information

Division's Location in the Organizational Structure

The Division being considered in this study is the Strategic Business Management (SBM) Division within the Department of the Navy (DON) Secretariat. Its organizational location is described below.

The organization of the Department of the Navy is as follows: it includes its two military organizations under the Chief of Naval Operations and the Commandant of the Marine Corps; four Assistant Secretaries; and a series of staff offices, such as the General Counsel (U.S. Navy, 2002b). One of the assistant secretaries is the Assistant Secretary of the Navy (Research, Development and Acquisition).

This Assistant Secretary's office is composed of seven Deputy Assistant Secretaries of the Navy (DASN) related to major system acquisition; the Program Executive Officers (PEO's) and Direct Reporting Program Managers (DRPM's), all of which relate to major system acquisition; one DASN related to programming and budget activities; three acquisition process-oriented offices: General Counsel; and the Navy's System Command organizations. One of these process-oriented offices is the Deputy for Acquisition and Business Management. SBM is part of the Deputy's organization, which consists of three Divisions and a staff group (U.S. Navy, 2002a).

Division's Staffing and Physical Location

The Division is staffed with persons who are employed by the Navy and a variety of firms and who work in a number of locations, thereby meeting the definition of a "virtual organization." The following list of some key employers and locations is illustrative and not

exhaustive. Its purpose is to demonstrate the varying locations that these people visit to accomplish their work and, therefore, highlight the necessity to have continuous multi-mode communications. The employers and work locations are

1. The United States Navy, whose employees work principally in Crystal City in Arlington, Virginia; at contractor locations in Fairfax, Virginia; and at various Navy and Marine Corps activities within the United States, such as Norfolk, Virginia and San Diego, California. SBM's physical location is in Crystal City.

2. The Division's consultants, whose employees work in the locations noted above as well as in Newport, Rhode Island and Fairfax, Virginia.

3. Some Defense activities, with locations in Columbus, Ohio; Cleveland, Ohio; and Hill Air Force Base, Utah.

Division's Organizational Responsibilities, Work, and Results

The responsibility of SBM is "to simplify and modernize the Navy acquisition process in the area of contract writing, administration, finance and auditing" (U. S. Navy, 2002d).

The principal type of work accomplished to fulfill these responsibilities and produce the results noted below is knowledge work, consisting of program management and computer programming. Therefore, the people performing this work can be appropriately considered knowledge workers. Given the list of locations from which the people work, the Division is a virtual organization.

Beginning in January 1998, the Electronic Acquisition for the 21st Century Office (EA-21), the predecessor to SBM and the one from which SBM received its charter and tasks, led a DON-wide initiative to implement a paperless acquisition system by January 1, 2000, in

compliance with a Department of Defense (DOD) initiative (U.S. Navy, 2002d). Some of its key accomplishments include the following:

1. It created and implemented an End-to-End Procurement/Financial Concept of Operations, which outlines the systems to be used to attain a paperless acquisition goal.

2. Beginning in 2002, it led the Acquisition Functional Area Management team, which is responsible for reducing the number of computer systems and databases used by Department of the Navy activities to accomplish their acquisition programs.

3. It implemented Purchase Request Builder (PR Builder), a Web-based system that allows the workflow of a Purchase Request from the requiring activity to the contracting office.

Some of the key results are:

- a. There have been more than 20,000 transactions since the system's inception in early 2000. There are 300 new transactions every week.
- b. There are more than 4,500 users, with 30 persons added every week. These people are located both within the Continental United States (CONUS) as well as outside the Continental United States (OCONUS).
- c. There are 300 sessions every day.
- d. Users are supported by having 24x7 access to the application as well as 9 hour per normal working day access to a Help Desk staffed by real persons. This Help Desk is located in SBM's physical work place.
- e. The DON is continuing to deploy the system on a Department-wide basis.

4. It implemented the DOD Standard Procurement System (SPS) within the DON. This server-based system provides the contracting community the ability to perform automated

procurement and to ensure the paperless flow of digital information to and from automated financial systems. This System is a key link in the DOD's efforts to produce an unqualified financial statement, as required by statute. Some of the key results are:

- a. The DON SPS implementation has 5,700 CONUS and OCONUS operational users at 218 DON sites.
- b. In Fiscal Year 2001 (October 2000 to September 2001), these users processed more than 147,000 actions (out of a DON-wide total of over 411,000), worth more than \$11.5 billion (out of a DON-wide total of more than \$43.4 billion).
- c. The Division continues to deploy the System, as DOD makes newer versions available.

5. It worked with the DOD in developing, and is in the process of implementing, the Wide Area Workflow (WAWF) system within the DON. This Web-based system is used by a number of parties (e.g., suppliers and financial people) to approve and track suppliers' invoices to final payment. This System is another key link in the DOD's efforts to produce an unqualified financial statement, as required by statute. Some of the key results are not yet available because the system is just beginning implementation within the DON environment. It is projected that all DON activities, which are involved in some aspect of acquisition, will soon be using the fully deployed system. The estimate of such activities is 1,000 and of users is 10,000 (U. S. Navy, 2002c).

Researcher's Background with this Organization

The researcher was employed within ABM for 17 years. For the last two years of this period, he was assigned to SBM. During these 17 years, he filled many positions, including

servicing as the Policy and Resources Division Director and the Strategic Business Management Division Director. He was assigned to SBM, although not serving as the Division Director, during the time when the Internet-based communication loss and restoration occurred. Finally, his Division Director responsibilities were reassigned in July 2002 and he ended his employment with this organization in August 2002.

As a result, he considers himself (a) an inside direct participant in the situation; (b) knowledgeable of this organization's people and culture; and (c) no threat to the participants.

Statement of the Problem

The SBM Division depends on people from a variety of employers to accomplish its work, the bulk of which is knowledge work. The people associated with the Division are knowledge workers. Many of the people associated with the Division accomplish their tasks not in the SBM physical work location, but at other locations. The Division was able to complete much of its work through the use of Integrated Project Teams (IPTs), which included representatives from many of the U.S. Navy's major commands. It conducted much of its business through the use of the Internet-based communication modes as well as telephones and fax machines. It stored the vast majority of its records electronically on computer file servers.

The communication loss due to a change in network service provider had a direct impact on the Division's ability to perform its mission; the restoration of communication had a direct, though different, impact on the Division's ability.

This study addresses this essential question: "What did this group of knowledge workers do to obtain required results when the virtual organization loses the Internet-based component of its communication capability?" In this light, it is important to determine the effects on

individuals in the organization, their work-related interpersonal relationships, their work processes, their results, as well as to obtain their views on the various implications of the problem for society.

Purpose of the Study

The purpose of this study is to determine the organizational effects, from the participants' point of view, related to SBM's loss and restoration of its Internet-based communications.

The study's objectives are to obtain, from the SBM employees and consultants, an assessment of the ways that the communication loss and restoration affected their work-related interpersonal relationships, their work processes, and their results; to obtain their assessment of the impact on organizational results; and to obtain their ideas on the ways in which a similar communication loss and restoration could affect organizations, in general, or society, as a whole.

Theoretical Framework for the Study

This discussion is broken into two components: the theoretical framework itself and the study's propositions.

The Theoretical Framework Itself

The study's theoretical framework is based on Drucker's thinking related to customers' needs, business purpose, and business activities to meet those customer needs. Specifically, the framework is based on Drucker's (1974) thoughts that

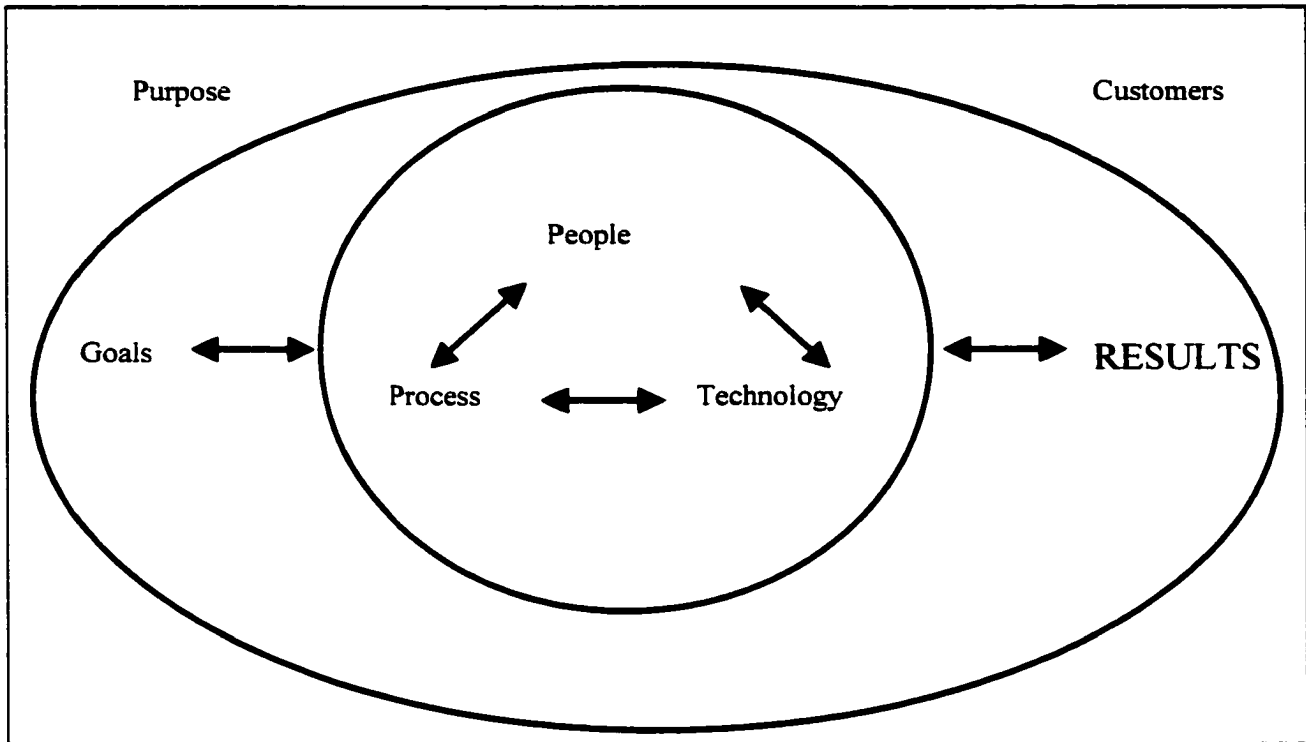
1. "There is only one valid definition of a business purpose: *to create a customer*" [emphasis in the original] (p. 61).

2. "The customer is the foundation of a business and keeps it in existence. He alone gives employment. To supply the wants and needs of a consumer, society entrusts wealth-producing resources to the business enterprise" (p. 61).

3. "The business enterprise has two—and only these two—basic functions: marketing and innovation. Marketing and innovation produce results; all the rest are 'costs'" (p. 61).

The organization being studied is a governmental entity and not a business. Nonetheless, Drucker's thinking (when applied in this case) provides appropriate baseline information because this organization produced valid customer-focused results as noted above. In particular, DOD and DON leadership (i.e., a customer) determined to proceed on a course of increasing the use of paperless processes and decreasing the use of paper in some of its transactions (i.e., customer need). SBM was assigned a set of implementation responsibilities, provided with appropriate funding (i.e., received wealth-producing resources), and produced a series of computer-based systems, which were used to satisfy these needs (i.e., innovation). By collaborating with the DON commands that would use these systems (i.e., marketing), the results noted above. The people doing the work of collaboration and system implementation were bound together through a process and technology (i.e., costs).

These ideas are linked and illustrated in Figure 4, the model of the study's theoretical framework.



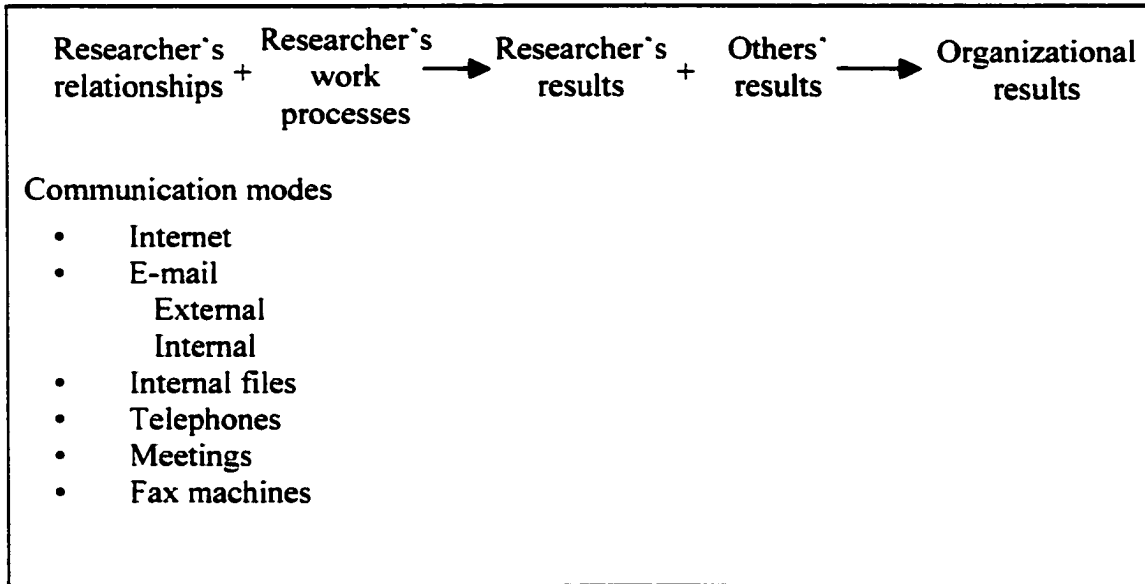
(Source: Callaway, 2002)

Figure 4. The organizational alignment, focusing on internal operations, showing the connection among customers, organizational purpose, goals, people, process, technology, and results.

This model illustrates the theoretical framework that successful alignment of organizational purpose and goals with the persons with which it has a relationship, its processes, and its technology will produce the results sought by the organization's customers. Callaway (2002) developed this model and validated it against a variety of other models (such as the Balanced Scorecard) and key authors (such as Burns and Drucker). His purpose was to provide an approach that describes the successful alignment of these key organizational elements.

This study focuses on the People-Process-Technology circle in the center of Figure 4. The researcher investigated how organizational members' work-related interpersonal

relationships, work processes, results, as well as organizational results were affected by the communication loss and restoration. Figure 5 illustrates the study's focus emphasizing the three critical elements of relationships (People), work processes (Process), and results. The Technology aspect of the center circle is the set of communications modes.



Source: Callaway, 2002

Figure 5. Connecting individual work with organizational results in conjunction with various communication modes.

Figure 5 is composed of two parts, the equation-like expression and the listing of communication modes. The expression focuses on organizational results being the consequence of individual and combined efforts of the persons involved with the organization; in addition, it indicates that individual results flow from the person's work-related interpersonal relationships and use of appropriate work processes. The listing of communications modes, which is identical to those in Figure 3, shows the communication modes that the persons use to accomplish whatever task is needed. One way of understanding Figure 5 is to consider the communication

modes as being applicable for each part of the expression. For example, meetings may be appropriate for maintaining individual work-related interpersonal relationships as well as for working together collaboratively with each person's results leading to organizational results. A work process example is using e-mail to distribute information needed by persons involved in a project.

McGrath and Hollingshead (1994) suggest a conceptual framework for studying the impact of technology on groups. This framework provides a methodology for considering all the variables in these situations, by breaking these variables into four "panels" with "classes of input factors." The Input Factors panel contains classes such as member attributes, technology, tasks/projects/purposes; the Organizing Concepts panel has groups as consensus generating systems as one of the classes; the Process Variables panel contains items such as participation and normative regulation. The fourth panel, Outcome Factors, has classes of Task Performance Effectiveness (composed of quality, quantity, speed/costs), User Reactions (namely, satisfaction with process and outcomes), and Member Relations (specifically, attraction and feelings of impersonality) (p. 95).

This last panel supports this study's theoretical framework. McGrath and Hollingshead (1994) are concerned with the ways groups interact through the medium of technology and note, "more has been written about what these technologies will do *for* groups than what they will do *to* the groups who use them" [emphasis in original] (p. vii). In this context, the Outcome Factors panel is meaningful because it focuses attention on task performance effectiveness (in this study, results as seen in Interview Questions 4 and 5), user reactions (in this study, process and results

as seen in Interview Questions 1 and 3), and member relations (in this study, work-related interpersonal relationships and seen in Interview Question 2).

Pfeffer and Fong (2002) suggest that business schools follow a series of five previously articulated recommendations in order to bring a greater return on the research accomplished in and by business schools. Of the five recommendations, the following four are directly applicable to this study while the fifth relates to the schools' rewards and hiring processes. The four recommendations are to (a) be more problem or phenomenon focused, (b) pay attention to observation, (c) listen to our subjects, and (d) be concerned with applicability as well as other aspects of theory (p. 89).

Accordingly, the researcher concludes that the study is meaningful and its theoretical framework is effective in obtaining the study's goals.

The Study's Propositions

The researcher's propositions are based on requirements to understand the ways that continuous Internet-based communications are needed for organizational effectiveness as well as their impact on virtual organizations. In this situation, the organization's leadership did not provide continuous communication service. In the context of this study, the technology changed by losing and restoring communication. Consequently, people left (or reduced their time in) the organization's physical workplace in order to accomplish their work. In this light, the researcher's propositions are that

1. The communication loss and restoration did not change the results demanded of the organization by its customers.

2. The communications loss caused no significant consequences on the individuals' results as well as on organizational results because the people wanted to get the work completed. Therefore, they found alternative work locations that offered the communications modes lost at the organization's physical location. These alternative work locations allowed them to complete their work.

3. The communications loss caused a significant consequence on the individuals' and organization's work process because the loss caused persons to leave the Division's work place to accomplish their tasks. In addition, their work-related interpersonal relationships took on a different nature (e.g., the individuals were not as close as they had been).

4. The communications restoration had very little impact on the adapted organization. In general, the persons continued to produce results using their modified processes; there were no impacts on their work-related interpersonal relationships.

Research Questions

As noted previously, the purpose of this study is to determine the organizational effects and results related to SBM's loss and restoration of its Internet-based communications from the participants' point of view.

This study has multiple objectives, all of which depend upon direct input from SBM employees and consultants regarding their experiences of communications loss and restoration in their division between 2001 and 2002. These objectives are threefold: to obtain an assessment of how the communications loss and restoration influenced work-related interpersonal relationships, work processes, and results; to obtain an assessment of the impact on organizational results; and

to obtain ideas on the ways in which a similar communications loss and restoration could affect organizations, in general, or society, as a whole.

The study's objectives are to obtain from the SBM employees and consultants an assessment of the ways in which the communication loss and restoration affected their work-related interpersonal relationships, their work processes, and their results; to obtain their assessment of the impact on organizational results; and to obtain their ideas on the ways in which a similar communications loss and restoration could affect organizations, in general, or society, as a whole.

Therefore, the research questions use the following logic in connection with the communication loss and restoration events:

1. The loss of communication happened. The restoration also happened.
2. How did you feel about it?
3. How did it affect the relationships you use to accomplish your work? What did you do about it? How did you do your job differently?
4. How did it affect your results as well as the organization's results?
5. Do you see any application of your experiences and ideas to other organizations or to society?

Accordingly, the specific research questions are

1. In what ways did the participants experience the loss and restoration of Internet-based communications?
2. In what ways did the Internet-based communications loss and restoration affect the individuals' results?

3. In what ways did the Internet-based communications loss and restoration affect organizational results?

4. In what ways did the participants see organizations, in general, or society, as a whole, affected by Internet-based communications loss and restoration?

Definition of Terms

The following definitions are used in this study. They are discussed, as needed, in the literature review.

1. The term, "ABM," in this study, is an abbreviation for the Deputy for Acquisition and Business Management and his office. A synonymous term is "the larger office." When referring to the Deputy for Acquisition and Business Management, the term, "the Deputy," is appropriate and relates to this specific person. In the DON culture and particularly in everyday conversations, the context reveals whether the individual (the Deputy himself) or the office (the Acquisition and Business Management group) is meant.

The Background element of this chapter outlines his role in the DON organization structure.

2. The term, "computer network," in this study, means "two or more computers that are connected with one another for the purpose of communicating data electronically" (*The New Encyclopedia Britannica Micropædia*, 2002, p. 509).

The following material amplifies this definition:

"Besides physically connecting computer and communication devices, a network system serves the important function of establishing a cohesive architecture that allows a variety of equipment types to transfer information in a near-seamless fashion... The two basic

[computer] network types are local-area networks (LANs) and wide-area (or long haul) networks. LANs connect computers and peripheral devices in a limited physical area, such as a business office, laboratory, or college campus, by means of permanent links (wires, cables, fiber optics) that transmit data rapidly... Wide-area networks connect computers and smaller networks to larger networks over greater geographic areas, including different continents... The largest wide-area network is the Internet, a collection of networks and gateways linking millions of computer users on every continent" (*The New Encyclopedia Britannica Micropædia*, 2002, p. 509).

3. The term, "Effect," in this study, means the result of the researcher's grouping a set of individual effects into one essential theme. Chapter 3 Methodology outlines the precise process. Capitalization is critical to distinguish this term from "effect" and "individual effect."

4. The term, "individual effect," in this study means the result of researcher's assessing the participants' experiences and expressed ideas and his combining them into a single thought that captures the essence of their thinking. Chapter 3 Methodology outlines the precise process. A synonymous term is "effect." Capitalization is critical to distinguish this term from "Effect." In certain places, such as Appendix E, the term is capitalized for formatting and not for meaning.

5. The term "Internet-based communication," in this study, means communications by way of the Internet and organizationally external e-mail. Specifically, it means the ability to communicate by way of e-mail and to search the Internet by way of a browser (such as Internet Explorer or Netscape Navigator). To be effective, this communication is "between two persons through computer-based means and that the computer-based means, to be effective, must be 'invisible' to the participants" (Callaway, 2002a, p. 2).

6. The term “knowledge work.” in this study, means creating, sustaining, sharing, and renewing data, information, individual knowledge, and knowledge culled from other sources to meet organizational needs. Tunick Morello (2000) provides excellent examples of knowledge work, which are “consulting, business incubation, entrepreneurship, advanced technology development, R&D, enterprise architecture, business analysis, musical composition, new product development, advanced application design, psychology and management coaching” (para. 6).

7. The term “knowledge worker.” in this study, means a person, operating in an organizational role, who applies ideas, concepts, and information rather than manual skill or brawn to yield organizationally appropriate results. These persons are not restricted to business or commercial firms as might be implied by the examples in the “knowledge work” definition. Knowledge work occurs in all organizations because all organizations perform some level of creation, transformation, and integration and analysis of data.

8. The term “network.” in this study, means “an interconnected system” (*New Webster’s Dictionary and Thesaurus of the English Language*, 1995, p. 672).

9. The term “organization.” in this study, is Hall’s (1999) definition. He states “An organization is a collectivity with a relatively identifiable boundary, a normative order (rules), ranks of authority (hierarchy), communications systems, and membership coordinating systems (procedures); this collectivity exists on a relatively continuous basis, exists in an environment, and engages in activities that are usually related to a set of goals: the activities have outcomes for organizational members, for the organization itself, and for society” (p. 30).

10. The term, "SBM," in this study, is an abbreviation for the Strategic Business Management Division. Synonymous terms are "the office" and "the Division." The Background element of this chapter outlines the Division's role in the Department of the Navy organization structure.

11. The term "virtual organization," in this study, means "a geographically distributed organization whose members are bound by a long-term common interest or goal, and who communicate and coordinate their work through information technology" (Ahuja & Carley, 1998, para. 6). For the purposes of this study, there is no distinction among the terms "virtual organization," "virtual team," "virtual group," "network organization," or any other term which addresses persons accomplishing work from different locations and which may or may not include the word "virtual." The researcher recognizes the differences among the terms, however, he draws attention to the fact that they all relate to persons coming together, from any number of locations, to accomplish a particular task or set of tasks.

12. The term "working full-time," in this study, means (a) the participants' assigned workplace was within ABM or SBM, and (b) they were there more than 50% of their time at the time of the loss of Internet-based communication.

Assumptions and Limitations

Assumptions

The study is based on the assumption that the communications loss and restoration did not affect the organization structure in any way because there were no organizational changes made, as demonstrated by the Deputy's organization chart as well as by the Deputy's charter revisions (as explained in the Chapter 4 element entitled "Purpose").

This outcome is conceptually supported by Heintze and Bretschneider's (2000) conclusion that "public agencies will not, in general, change their structures in response to IT" (p. 825). Their study was based on responses from 454 U.S. local government officials in four "critical local programs: solid waste and recycling, public works (or highways), criminal justice (the sheriff's office), and aging or elderly services" (p. 814). They caution about "extending these [all of the study's] conclusions to all public organizations" (p. 827). However, for purposes of this assumption, Heintze and Bretschneider's work is appropriate and valuable.

Limitations

This study is one in the organization and management field. The study's task was to create a focused list of effects (see Appendix B) that are based in this field of endeavor. The researcher used the logic and approaches of the organization and management field in making assessments, using examples, and drawing conclusions.

This study captures some of the experiences of a group of persons, who lived through an exceptional phenomenon—and frankly, one that is unacceptable for 21st Century American organizations. The enumerated Effects capture the key ideas, which flow from those experiences as well as the participants' understanding of the experiences. The individuals' point of view focuses on work accomplishment, which is consistent with this field.

This study is based in the organization and management field and not in psychology, sociology, or any other person-centered branch of understanding. The researcher used some ethnographic tools, such as The Ethnograph version 5.0, to facilitate the inquiry. The researcher did not consider things such as frustration, grief, or stress in the study; they are found as outcomes of the participants' comments.

This study is limited because the number of persons in the total population is 21 and the number of persons interviewed was 18, both of which may be considered small. The participants are those persons who were working full-time, as defined above, in the ABM or the SBM work place. The study addresses a specific Division in a particular organization during a specified time frame.

The study is limited because of available data. During the time the Division's communications were not operating, the researcher did not know that it would be the subject of this study. Therefore, he could not prepare himself or others to maintain data or information about their experiences for use in the study. The researcher relied on other persons' memories and perceptions for their detailed information.

The study is limited because it has only a few customers represented and these persons were physically located one floor away in the same building as the SBM Division. These persons and their situation are described in Chapter 3, under Sample and Population. This limitation is introduced because (a) the study's primary focus is on the organization's internal operations and not on its external interfaces; and (b) the organization has so many customers, who come from different organizations across the U. S. Federal Government and contractors and who have different types and levels of requirements, that separate work would be appropriate to gain their points of view. McGrath and Hollingshead (1994) indicate that this type of limitation is appropriate because they would encourage research in the [groups interacting with technology] area and not demand research "so comprehensive in scope that it would be impossible to carry out in practice (if not indeed impossible in principle)" (p. 122).

The study is limited because it makes no attempt to measure levels of “physical-ness” or “virtual-ness.” Measuring is outside the scope of the stated problem, which is focused on obtaining a set of effects, as articulated in the study’s title.

Nature of the Study

This study has the form of an embedded multiple-case design because it examines the affected persons’ responses to a particular set of events (Yin, 1994, p. 51). Eighteen affected persons shared their responses to the loss and restoration of communications. These people were working full-time in the ABM or SBM Division at the time of the communications loss. This situation is more fully described in Chapter 3.

Organization of the Remainder of the Study

This study follows the standard five-chapter dissertation format. Chapter 1 is the introductory material. Chapter 2 is the literature review. Chapter 3 outlines the methodology. Chapter 4 reports on the data collection and analysis. Chapter 5 provides the results, conclusions, and recommendations. Finally, references and appendices are included.

CHAPTER 2. LITERATURE REVIEW

Introduction

This literature review focuses on the critical elements of those key topics that bear directly on the study. The key topic is “virtual organization” because it is SBM’s nature and because it is needed for context. The other major topics are based on the People, Process, Technology, and Results portion of the model found in the Theoretical Framework of the study of Chapter 1. The following literature review directly focuses on “knowledge worker” (the People component), “knowledge work process” and “leaders’ role in ensuring communication” (the Process component), “communication technology” (the Technology component), and “results” (the Results component).

The literature review contains an introduction, a focused discussion of the topics, (including application to the study), and a summary.

Leaders’ Role in Ensuring Communication

The Literature

Gruenwald (2001) emphasizes the key role communications play in today’s business world: “The lifeline of most businesses is communications, and any disruption in service cannot only undermine consumer confidence, but also damage a concern’s ability to operate” (para. 4). This author is directly addressing the situation resulting from the September 11, 2001 terrorist attacks on the World Trade Center and the Pentagon; however, her idea illustrates the need for having continuous communications for work accomplishment.

This study’s definition of “organization” includes “communication systems” as a central component of an organization. The study’s definition of “virtual organization” states

“communicate and coordinate their work through information technology.” Recardo, Wade, Mention, and Jolly (1996) indicate that a successful team has particular characteristics, which include interdependence and interaction. These characteristics presume that effective communication exists (p. 6).

Key scholars have addressed the need for ensuring organizational communications by assigning it to organizational leaders. Barnard (1968) describes the “three essential executive functions” as “first, to provide a *system of communication* [emphasis added]; second, to promote the securing of essential efforts; and, third, to formulate and define purpose” (p. 217). Barnard indicates that this system of communication relates to the manner in which executives relate to one another within the formal organization structure as well as their informal networks (pp. 226–227). In describing the manager’s job, Drucker (1974) states that it is defined in four ways. Of the four, two are directly related to communication. He writes, “a managerial job is defined by relationships—upward, downward, and sideways” and “it is ...defined by the information flow needed for the job and by a manager’s place in the information flow” (p. 415). Bass (1990) outlines 16 basic interpersonal skills needed for success as a leader. The first item on this list is competence in communicating; by this he means the leader’s or manager’s ability to persuade others, to solicit feedback actively, and to be constantly reaching out for new information (p. 111). Likert (1961) reports on research of highly successful firms and suggests that this success is predicated on four characteristics. The third one relates directly to communication; he indicates, “Communication is efficient and effective. There is a flow from one part of the organization to another of all the relevant information important for each decision and action” (p. 99). Finally, Mintzberg (1973) reports on his study of managers. He found that managers fulfill

10 roles, which he breaks into three categories—interpersonal, informational, and decisional. Communication is present in every category and role. Some roles, such as disseminator and spokesman, are entirely dependent upon communication for effectiveness; others, such as resource allocator and entrepreneur, can only be effective through communication (pp. 54–94).

While some authors are addressing personal communications, which ensure personal effectiveness, others directly address organizational communications. In both cases, there is agreement that the leader is responsible to provide the communications system: any apparent disagreement among the authors—and the researcher sees no disagreement—would appear to be related to communications' purpose.

An Historical Example of Communication Loss: The Battle of Antietam

In 1862, Confederate General Robert E. Lee moved his army into Maryland as a strategic move for a number of reasons. (U.S. Army, n.d., p. 228). As part of his tactical planning, General Lee created a plan that divided his Army into groups. He documented this plan in Special Order 191, which was given to three other Confederate generals. A copy of this plan was found, wrapped around three cigars, in an abandoned Confederate camp and provided to Union General McClellan (McPherson, 1982, p. 281; Nevins, 1960, p. 219; U. S. Army, n.d., p. 228).

The communications failure in this case is the breakdown in the communications medium itself—a copy of Confederate General Lee's orders was given to Union General McClellan in lieu of one of the Confederate generals.

Some of the key results of this loss of communication were

1. General Lee suffered a “strategic loss” because he had to withdraw over the Potomac River into Virginia; the Union attained a “strategic victory”; and the battle itself was a “tactical draw” (U.S. Army, n.d., p. 230; Nevins, 1960, p. 225).

2. The Confederate and Union manpower losses on September 17, 1862 (the day of the battle) totaled approximately 25,000 men killed, wounded, or missing (U. S. Army, n.d., p. 228; McPherson, 1982, p. 285).

3. President Lincoln took advantage of this victory to issue the Emancipation Proclamation on September 22, 1862 (U. S. Army, n.d., p. 230; McPherson, 1982, p. 293; Nevins, 1960, p. 231).

Application to the Study

It is fair to conclude that (a) communication is central to an organization and its effective operations, (b) leaders are responsible to ensure that productive communication (both physical and virtual) exists, and (c) communication losses can have significant (indeed, life or death) effects.

Communication Technology

This discussion focuses on the lost and restored Internet-based communications. It does not address all the other technologies used by SBM or available to it and other organizations. It includes the elements of importance, usage, requirements, and availability needs.

The Literature

Knowledge Workers as Communications Technologies' Users

Knowledge workers, either in their roles as an individual or a team member, use the Internet-based communications technology (among other things) to accomplish their tasks. For

example, Gartner and the Massachusetts Institute of Technology (2001) report that core IT ingredients for the workplace are interpersonal communications (e.g., e-mail and instant messaging), alerting (e.g., IT system alerts the individual), information storage and dissemination (e.g., Web content management), and process management (e.g., data exchange through extensible markup language [XML]) (pp. 78–80). They also indicate that teams are supported by products specific to the team function, such as an accounting package, as well as general use ones, such as e-mail and instant messaging (p. 80). The researcher notes that the Web content management and XML examples assume the existence of Internet-based communications.

Communications Technologies' Locations

The Internet-based communications addressed in this study are needed wherever tasks are accomplished. Persons are not necessarily limited to physical work locations. For example, “work can be done in the home, a client’s office, or on the road” (Rouse, 1999, p. 123). In addition, Gartner and Massachusetts Institute of Technology (2001) suggest, “work will move to wherever it can be best accomplished, regardless of ‘who’ owns the space or its supporting infrastructure. The ability to work in cyber- and physical space will be critical to successful work” and “workplace portfolio will transform itself from a collection of properties to a network of places and electronic connections” (p. 104).

Communications Technologies' Importance

These technologies are important because they enable persons to accomplish tasks, which lead to results. For example, Capella University is an online university. As such, persons can obtain degrees, obtain certificates, or take courses through the use of e-mail and Internet communication (as well as other communication forms) without having to leave their homes or

work locations. Another example is the United States Army, which sponsors both eArmyU (www.earmyu.com) as well as its University of Information Technology (UIT). Both Army universities support soldiers' need for life-long learning as well as personal and professional development; this educational approach allows the Army to have more people in combat units more frequently (with the consequential increase in readiness) (Caterinicchia, 2002).

All of these universities use the Internet as a key element of their instructional approach. Therefore, while these examples are based in the education industry, they show the importance of these communication technologies to results.

Communication Technologies' Requirements

In its reality, SBM lost and restored its Internet-based communications. (See Figures 1, 4, and 5 for the timing and full range of communications modes.) Therefore, this portion of the literature review focuses only on literature that clearly delineates a requirement for this type of communication as important to a virtual organization.

E-mail is mandatory as a part of a virtual organization (Fisher & Fisher, 2001, p. 135) as well as for any organization (Weill & Broadbent, 1998, p.7). Similarly, these same authors indicate that an Internet access is also necessary. More broadly, they also claim that organizations need other communication modes, such as intranets, FAX service, teleconferencing equipment, and printers. (It is noted that these authors did not address face-to-face communication.) From this broader perspective, Tunick Morello, Caldwell, Golmolski, Mahoney and Frey (2001) address these same type requirements. These authors approach the situation from the knowledge workers' effectiveness point of view and, more broadly, would also require collaborative applications (of which e-mail is one form) as well as high-speed

network connections (which relate to internal and external communications). Finally, Townsend and DeMarie (1998) broadly outline a virtual team's technology requirements as desktop videoconferencing systems, collaborative software systems, and Internet and intranet access.

There are other authors who delineate these same needs. The essential message, though, is that the workplace infrastructure has changed to include these many forms of digital communication. Not to have access to them is to limit the organization's and individual's ability to complete tasks as effectively as they might have been completed.

Communications Technologies' Availability

From the knowledge workers' point of view, the operative rule for availability is "whenever I need it."

Cascio (2000) indicates, "...technology is the remote worker's lifeline." As such, "technology must work flawlessly, and technical support should be available 24 hours a day, seven days a week. (Or at least a help desk should be staffed from 8 a.m. to midnight)" (p. 82). Tunick Morello et al. (2001), from the same point of view noted above, indicated that knowledge worker performance is degraded by factors such as thin support staff, unmanaged e-mail, and technology saturation (p. 21).

The Alternative Workplace

Apgar (1998) describes "the alternative workplace." His discussion covers many elements that are beyond the scope of this study. However, he notes, "Independent employees can set up *anywhere* and *anytime* with a *computer, modem and telephone line*" [emphasis added]. They do not need dedicated, pre-assigned workspaces; often favor a home office; and enjoy freedom to set up their workspace according to their personal tastes (p. 134).

Assumption of Continuous Communications Service

The assumption of continuous communications service underlies the implementation and execution of many organizations' communications technology. Since it is an assumption, it is difficult to address directly but can be seen in various ways. One of those ways is the literature on an organization's adopting virtual approaches to their operations. Other ways, such as business continuity planning, are outside the scope of this study and, therefore, are not pursued.

Apgar (1998) indicates that there were approximately 30 to 40 million persons who were either telecommuters or home-based workers. The business reasons for this situation are that firms have reduced costs, increased productivity, and have found these work situations to be effective in recruiting and retaining motivated employees (pp. 121–122). Cascio (2000) delineates a series of business reasons for the virtual workplace. His reasons include those of Apgar, but add higher profits, improved customer service, access to global markets, and environmental benefits. In its Telework Policy, the United States Department of Defense outlines a set of reasons for engaging in telework. Those reasons are similar to the ones enumerated by Apgar and Cascio (U. S. Department of Defense, undated, para. A). Finally, Markus, Manville, and Agres (2000) studied some virtual groups that produced open source software, such as Mozilla and Perl. They found that these virtual groups effectively produced the software because of the work-related interpersonal relationships among the group members. For example, the groups wanted a share in the collective success, they controlled their own membership, and they used effective work structures and processes (p. 14).

In summary, organizations are adopting and using virtual approaches because they can—the infrastructure is available to support it—and because (as illustrated above) it makes sense to do so.

Because of the emphasis to become virtual or more virtual, as illustrated above, there is no literature (or, at least, the researcher did not find any) that directly addresses the assumption of continuous communications service. There is literature on business continuity planning. It is considered outside the scope of this study because it addresses actions taken to ensure that a loss does not occur or, at least, that it is of limited time duration and because it covers situations other than those of this study. There is information on the events and consequences of communication loss such as the U. S. Department of the Interior story found in the Prologue as well as Garvey's (2002) report on Pace University's loss of communication because of the September 11, 2001 terrorist attacks on the World Trade Center, where Pace had some servers. Pace lost Internet access for approximately one week; it is now engaged in an aggressive plan of "backup, recovery, and overall business continuity" (p. 26).

The researcher believes that this situation (i.e., the assumption of continuous communication service) is caused by (a) individuals' experience of continuous communications service from American telephone companies and (b) communications service outages being generally short-lived and not as long as that experienced by SBM.

Application to the Study

The key element of this portion of the Literature Review is the clear delineation of the continuous communications service requirement for a virtual organization to be effective.

Knowledge Worker

The Literature

The literature review provides information related to the study's definition of the term "knowledge worker" for this study and outlines the things needed for a knowledge worker to be successful.

Definition

The literature is not settled on a definition of this term. As shown below, an appropriate definition of the term "knowledge worker" needs to contain information that allows others to understand the meaning of the term and to be able to identify the times when persons are fulfilling this organizational role.

Authors' ideas. The term "knowledge worker" was first used in approximately 1960 (Drucker, 1993, p. 6). Drucker (1969) defined the term as "the man or woman who applies to productive work ideas, concepts, and information rather than manual skill or brawn" (p. 264). He, generally, relates this person to those in a "professional, managerial, and technical" grouping (Drucker, 1954, p. 329; Drucker, 1965, pp. 97–99). Drucker (1999) noted that a knowledge worker is a highly trained employee...who adds to a company's output by applying their knowledge.

Several others agree with Drucker's grouping. For example, Sveiby (1997) indicates that "most employees of knowledge companies are highly qualified and highly educated professionals—that is, they are knowledge workers" (p. 19). Eppler (2002) suggests the definition of a knowledge worker as a "highly skilled professionals who are involved in the non-routine production, interpretation, and application of complex information" (para. 1). Finally,

this term has been defined as follows: “A knowledge worker is anyone who works for a living at the tasks of developing or using knowledge.” This definition continues with examples, which provide insight into the author’s point of view; some of the key examples are “programmers, systems analysts, technical writers, academic professionals, lawyers, teachers, and scientists of all kinds” (searchCRM.com, 2002, para. 1).

In contrast to this alignment of knowledge worker with a professional status by organizational position or job title, several authors do not directly define it, but rather address the term on a more directly task-accomplishment (or knowledge work) basis. For example, Allee (1997) suggests that, since the knowledge component of *everyone’s* [emphasis in original] work has increased dramatically, one way of bringing meaning to this broad term is to relate it to those persons (including FedEx truck drivers and those in manufacturing facilities) who are communication and computer dependent (p. 215). She continues by suggesting that since an organization is a system and that knowledge is everywhere in the organizational system, it is useful to concentrate on the knowledge aspects of *all* [emphasis in original] the work we do (p. 216). Fisher and Fisher (1998) make the points that (a) persons are knowledge workers because the majority of their work is knowledge work, (b) the amount of knowledge work in most jobs is increasing, and (c) everyone’s job has some physical and knowledge aspects (pp. 19–20). Finally, Lawrence and Nohria’s (2002) discussion of United States manufacturing sector changes in the last 30 years includes the thought, “Redesign the more routine jobs so that they contain some variety and some responsibility from problem solving so that all employees can to some extent be knowledge workers, using their brains to learn and to invent ways to enhance performance” (p. 243).

Summary. In summary, the researcher chose to use a modification of Drucker's (1969) definition of the term "knowledge worker" for this study. The selected definition is "a person, operating in an organizational role, who applies ideas, concepts, and information rather than manual skill or brawn to yield organizationally-appropriate results." He selected this approach because it highlights the importance of making information useful for organizational results, it emphasizes the fact that knowledge workers fill organizational roles, and it is inclusive of all organizational work.

Things Needed for Success

The next matter, then, is to determine what the knowledge worker needs for successful results. Drucker (1974) suggests that making knowledge work productive and the knowledge worker achieving may be the "central social problem of the new, the knowledge society" (p. 177). The researcher realizes that this point of view is 25 years old; however, Drucker (1999) is still writing (with some urgency) about knowledge worker productivity—"the biggest of the 21st century management challenges" (p. 157).

Knowledge workers need the following items to be successful (or, at least, be approaching success). Specifically, they need

1. A sense of purpose, such as a clearly articulated and widely understood organizational mission, vision, as well as current and future direction (Weick, 1985, p. 213; Nonaka & Takeuchi, 1995, p. 15; Allee, 1997, pp. 39–40).

2. The proper tools to complete their tasks. These tools include autonomy, electronic tools, access to people with required information and knowledge, and appropriate processes and data sources (Allee, 1997, pp. 39–40 and 241; Drucker, 1999, p. 142; Prusak, 1997, p. xiii).

3. Appropriate treatment as persons contributing to the organization's success. Such treatment includes integration of quantity and quality of work, participating in continuous learning, and seeking continuing innovation (Drucker, 1999, p. 142; Sveiby, 1997, p. 94; Allee, 1997, p. 216).

4. A community within which to work. "It is impossible to talk about knowledge without addressing the way people work together, learn together, and individually and collectively grow in knowledge (Allee, 1997, p. 39).

5. Appropriate performance feedback, such as metrics and performance reviews (Allee, 1997, p. 40).

Application to the Study

This definition is broad enough to cover all the affected persons—those in the population. The set of needs provides a baseline for having conversations in connection with the interview questions.

Knowledge Work Process

The Literature

Allee (1997) outlines a group of processes for each of the key elements of knowledge work: creating, sustaining, sharing, and renewing. For example, the "creating" element contains processes of generating and combining; "sustaining" contains identifying, storing, analyzing, and applying processes; "sharing" contains communicating and teaching processes; and "renewing" contains processes of changing, improving, deepening, and adapting (p. 114).

Fisher and Fisher (1998) indicate that the knowledge work process is, generally, non-linear. However, they note that knowledge work can easily have a linear process. One of their

examples of non-linear work relates to penicillin, which was found by (perhaps accidental) discovery. It is very easy to understand that inspiration can be an element of non-linear knowledge work. In contrast, linear knowledge work can be seen in some insurance form processing, writing lines of computer software code, or preparing questions for a court appearance (pp. 13–16).

Olson (1999) provides an entire table that compares traditional and virtual work processes along 21 different characteristics. Some of his characteristics are face-to-face interaction versus electronic interaction, members from the same versus different organizations, the hope for trust versus requiring trust, and the need for periodic versus continuous communication (p. 24). Of particular relevance to this topic, Olson's table indicates that, in a traditional work process, there is a downstream focus and a rigid work process, which contrasts to the virtual work process that has a whole process focus and is flexible. It is understood that his table is summary in nature and could be debated on many points. However, it is an excellent base for this study. Furthermore, one of the most striking aspects of this list is that it is essentially a general statement of requirements for a virtual organization's work processes. Specifically, of the 21 characteristics, 11 directly, or by implication, require some sort of electronic or information technology support. For example, he includes the characteristics of "distributed resources linked electronically," "continuous communication," "continuous sharing of incomplete work," and "members work together-apart" (p. 24).

Application to the Study

This literature provides a point of origin for interview conversations. Specifically, the participants were asked to describe the ways they perform or the work they do when they create.

sustain, share, or renew. In addition, they can describe the effects on their personal processes from the communications loss and restoration.

Virtual Organization

The Literature

The study's definition of the term "virtual organization" is found in Chapter 1. One of the key aspects of the definition is the requirement that the people in this organization communicate and coordinate work through information technology. People are taking advantage of this method of conducting business. For example,

1. Telework is increasingly popular and is being addressed to ensure productivity (U.S. Department of Defense, 2001).
2. Persons are establishing Internet community-based businesses (Figallo, 1998).
3. Government agencies are delivering service and interacting with constituent groups, other agencies, and different governmental levels (i.e., federal-state-local) through information technology (Holmes, 2001).
4. Organizations are urged to redo strategy, consider their business relationships as "networks of partners," and reconstruct organizations in light of information technology capabilities (Kanter, 2001).
5. Persons are urged to be effective leaders by designing physical and online environments, creating rituals and shared experiences, resolving conflicts between actions and words, and engaging persons across all sorts of organizational boundaries (i.e., alliances, subcontractor, inter-Departmental, and intra-Departmental) (Boone, 2001).

All these imperatives are (at least, partially) dependent upon persons' ability to perform successfully in a virtual organization or virtual situation because they can interact through information technology.

Equally important, all these imperatives assume that there is a common understanding of how a virtual organization operates. Some researchers indicate that this understanding is not available.

Heintze and Bretschneider (2000) indicate that few researchers have examined the relationship between communication (presumably all modes and not just digital) and tangible organizational outcomes. They also raise a question concerning which communication systems are appropriate for public organizations (again, presumably not just digital). Finally, they conclude, "The strong political environment of the public organization implies that public IT must aim to facilitate communication between both the organization and its environment, as well as internally (p. 807). This series of ideas contains two threads: a lack of information—communication and outcome relationship—and a requirement—IT must facilitate communication.

Nazer (2001) studied ways in which a particular network of colleagues, who were geographically distant from one another, interacted electronically to accomplish their goals. The people used all forms of communication, including, for example, telephones, e-mail, and meetings. She concluded, among other things, that (a) there is a "lack of theoretical and empirical evidence of how virtual organizations function" (p. 194); (b) future research is needed to understand how ...virtual...organizations operate in societies being transformed by...[the] Information Age (p. 206); (c) there is a lack of empirical research which evaluates...“the

conditions virtual organizations can operate under” (p. 206); and (d) no research has been done to support management claims that virtual organizations are more responsive to market demands (p. 206).

Olson (1999) studied a group of persons, during an experiment in which they used a telephone conference and a synchronous whiteboard capability to accomplish a particular set of tasks. He suggested the following lines of future inquiry.

1. Similar to Nazer, he concluded that there is little research on teams functioning in virtual work environments (p. 316).

2. He suggested that there is little research on the “impact of electronic communication on teams in the virtual work environment” (p. 430).

3. He states, “The effect of technology on communication norms, communication practices and processes, pace of interaction, distribution of participation, increased task interaction, and reduction of personal interaction on work groups all need more study” (p. 436).

4. Future studies on “task performance effectiveness will want to investigate all dimensions of task performance,” specifically, quantity, quality, cost, speed, and time (p. 437).

Olson (1999), in his discussion of the virtual organization, indicates that part of the reason for this apparent conflict of views may be simply that the virtual organization “represents a new way of thinking about working, compensation, perks, status, socialization, teamwork, management, and leadership” (p. 22).

McGrath and Hollingshead (1994) assessed the body of literature related to groups interacting with technology. While their assessment is somewhat dated and the literature being examined is related to virtual organizations, their conclusion is not directly relevant. However,

they make the point that “past research...does not constitute a tightly woven, cumulative body of information, but rather a scattered picture of noncomparable findings about relations between different independent and different dependent variables, for systems varying in group and member characteristics, tasks and task characteristics, technology and situational conditions” (p. 121).

Application to the Study

This study’s contribution is based on the gaps noted by Heintze and Bretschneider, Nazer, Olson, and McGrath and Hollingshead. These authors make the point that there is a limited understanding of how a (fully communicating) virtual organization operates. This study, then, proceeds on the basis that, if there is only a limited understanding when communications are available, then there is no understanding if those communications are not available or, at least, seriously disrupted.

Failure

The Literature

Clarke and Perrow (1999) indicate that, regardless of the failures experienced through corruption, unwise investments, or similar actions, there is only one work that addresses the phenomenon—Meyer and Zucker’s *Permanently Failing Organizations*. In fairness, it must be noted that Anheier (1999) has compiled an anthology of views (including Clarke and Perrow (1999)) on the subject. In the anthology, Anheier and Moulton (1999) outline four approaches—organizational, political, cognitive, and structural—for studying failure (p. 275).

There are two types of causes of failure suggested in the literature. Hartley (1997) defines the first type as mistakes of omission and commission. Mistakes of omission are “those in which

no action was taken and the status quo was contentedly embraced amid a changing environment. Alternatively, mistakes of commission “involve bad decisions, wrong actions taken, misspent or misdirected expansion, and the like” (p. 2).

In contrast, Miles and Snow (1994) indicate that they see two forms of organizational failure. The first form is externally initiated misfit; the second one is internally initiated misfit (pp. 66–67). They believe that an effective firm has a fit of strategy, structure, and managerial philosophy (p. 3). When a misfit occurs in this alignment, a failure is certain to follow. A misfit can be the result of the organization’s not responding to changes in external forces quickly or appropriately (p. 66). Internal forces, such as managerial decisions or effects of those decisions, can also cause a misfit to occur (p. 68).

Thornhill and Amit (2000) studied Canadian firms’ bankruptcies in light of the firms’ age and size. They found that young firms failed because of insufficient initial organizational capital and inadequate managerial capabilities. In contrast, older firms failed because of ineffective response to environmental change (p. A1). This finding about older firms’ longevity directly illustrates Miles and Snow’s idea concerning externally initiated misfit and its consequences.

It is clear from these authors that, notwithstanding what it is called, a failure is based on a human decision to act or not to act. The authors use different terms and see the same phenomena from slightly different points of view. However, both these descriptions focus on the responsibility to decide and to be accountable for the decision.

Notwithstanding the source of or rationale for a failure, the affected persons respond to it in varying ways. Generally, they try to get their work finished in the face of the failure. Tucker, Edmondson, and Spear (2001) studied front-line nurses in a hospital, as they performed their

daily tasks. Kim and Miner (2000) studied U.S. commercial banking industry failures, searching for inter-organizational learning within the industry.

Coutu (2002) reported on her work as it relates to resilience. She found that resilience theory overlaps in its description of resilient people. These persons have “staunch acceptance of reality; a deep belief, often buttressed by strongly held values, that life is meaningful; and an uncanny ability to improvise” (p. 48).

This work suggests the following strategies:

1. Persons remove the exception (Tucker, Edmondson, & Spear, 2001, p. C1) through improvisation to obtain new solutions (Coutu, 2002, p. 52). They try alternative solutions to service failures in order to complete their tasks.
2. They remove the root causes (Tucker, Edmondson, & Spear, 2001, p. C1). Action is taken to prevent recurrence of a particular service failure.
3. They adapt to the failure (Tucker, Edmondson, & Spear, 2001, p. C2). In other words, they “make do” in the new and different situation—an improvisation (Coutu, 2002, p. 52), after they have accepted the reality of the new situation (Coutu, 2002, p. 48).
4. They downplay errors and failures (Tucker, Edmondson, & Spear, 2001, p. C2).
Managers often join the employees in this behavior.
5. They engage in “heroic” actions. This behavior was found to be in line with nursing norms of patient service (Tucker, Edmondson, & Spear, 2001, p. C5). In addition, it can be seen as acting on the values of a meaningful and purposeful life (Coutu, 2002, p.50).
6. They learn from other firms’ failures and near failures (Kim & Miner, 2000, pp. G2–G3). The authors report that near failure is a much more effective instructor than failure itself

because the individuals affected by the near failure remain to relate their experiences to other persons.

Application to the Study

In the case being studied, there was a service failure that could be described as a mistake of omission (Hartley, 1997, p. 2). This failure was caused by the unwillingness to respond to a major environmental change of a loss of network service (Miles & Snow, 1994, p. 67; Thornhill & Amit, 2000, p. A1).

Results

The Literature

Results Themselves

Results need to be customer-based, connected to the organization's operations, seen from a time-based dimension, and based on a number of objectives.

According to Drucker (1954; 1974), "There is only one valid definition of business purpose: *to create a customer*" [emphasis in original] (p. 37; p. 61). The customer considers value along a number of lines, for example, price, durability, freedom from breakdown, maker's standing, and purity. The only method by which the organization can assess this value (i.e., organizational results) is by asking the customer (Drucker, 1954, pp. 54–56). More recently, Drucker (1999) reiterates these same ideas by saying, "The starting point [for management] has to be what *customers consider value*. The starting point has to be the assumption...that the customer never buys what the supplier sells. What is value to the customer is always something quite different from what is value or quality to the supplier" (p. 29).

Thomke and von Hippel (2002) reveal how some firms understand their customers' needs [and, therefore, achieve their results] by allowing their customers to innovate with them. Specifically, these firms equipped their customers with tools to design and develop their own products, ranging from minor modifications to major new innovations. These user-friendly tools, such as computer simulation and rapid prototyping make product development faster and less expensive. The authors provide five steps that allow customers to become innovators; they are to develop the tool kit, increase production process flexibility, choose the first customer well, evolve the tool kit continually and rapidly, and adapt their business practices (pp. 74–79).

In addition, "The focus of the organization must be on *performance*" [emphasis in original] (Drucker, 1974, p. 456). As a side note and specifically not a thorough review and analysis of Drucker's writings, the researcher noticed that, in his earlier writings (for example in Drucker [1954 and 1974]), Drucker tends to use the term "performance" in lieu of "results"; however, in Drucker (1999), he draws a clear distinction between the two ideas. He says that "*results of any institution exist only on the outside*"; "management must focus on the *results and performance of the organization*"; and "*management exists for the sake of the institution's results*" [emphasis in original] (pp. 38–39).

Performance is, of course, based on managerial decisions. Drucker (1954) outlines the integrated nature of management, which is seen in those management decisions. The decisions are based on the three jobs of management that are managing a business, managing managers, and managing worker and work; in each of these jobs, a present and future dimension can be distinguished. In its daily work, management cannot separate them; further, it cannot separate the time dimensions (p. 16).

Drucker (1974) concludes that organizational managers and leaders must impose on themselves the following multi-disciplined approach:

1. Define “what is our business and what should it be.”
2. Derive *clear objectives and goals*.
3. Think through *priorities* of concentration which allow them to select targets, to set standards of accomplishment and performance (i.e., to define the minimum acceptable results), to set deadlines, to go to work on results, and to make someone accountable for results.
4. Define *measurements of performance*.
5. Use the measures to *feedback*, that is, to build *self-control from results* into their system.
6. Have an organized audit of *objectives and results*, to identify those objectives that no longer serve a purpose or have proven unattainable [emphases in original] (pp. 158–159).

The set of objectives to be achieved by the organization is illustrated by the following ideas. Gray (1987) cites Fayol’s six functions of “organizational undertakings,” which comprise technical, commercial, financial, security, accounting, and managerial. In addition, Fayol notes that these six essential functions are interdependent and cannot exist independently (p. 9). Therefore, he indicates (at least by implication) that objectives are needed in each one of these functional areas. Specifically, he writes about the commercial function (which relates to buying, selling, and exchange) that pricing must be balanced to both the buyer and seller because to do otherwise would “distort the costs of goods sold...and have consequent impacts on divisional earnings statements. *Management cannot operate properly when such basic operating statements do not reflect a true state of affairs*” [emphasis added] (p. 10).

Drucker (1954) indicates that objectives are needed *“in every area where performance and results directly and vitally affect the survival and prosperity of the business”* [emphasis in original]. He continues by outlining eight such areas—market standing, innovation, productivity, physical and financial resources, profitability, manager performance and development, worker performance and attitude, and public responsibility (p. 63). He provides another almost identical set of objectives when he requires objective setting for marketing, innovation, human organization, financial resources, physical resources, productivity, social responsibility, and profit requirements (Drucker, 1974, p. 100).

Another point of view that illuminates an organization is envisioning it as a system. In doing so, Scott, Mitchell, and Birnbarum (1981) indicate that a system has three goals: internal stability, growth, and adaptability (p. 48). These goals are fundamental to the organic models of modern organization theory and are useful in appraising organizational “health” (p. 50). An additional aspect of this point of view is that it understands that one of a system’s key characteristics is the interdependency of the parts to each other and the whole (p. 44).

Baker (1973) reports Tilles’ (1963) ideas that the managerial task has four basic parts:

1. Thinking about how the organization’s systems fit together and defining its boundaries, especially in light of who or what is included in the organizational systems.
2. Establishing system objectives, which allow the manager to look outside as well as inside the organization to see its demonstrated performance.
3. Creating formal subsystems—groups and entities—to execute the organization’s activities.
4. Performing systems integration to ensure the subsystems are working well together.

Additionally, both Johnson, Kast, and Rosenzweig (1964) and French (1963) offer definitions of organizations as open systems that highlight the same fundamental matters of input, transformation, output, and feedback.

Results Assessment

It seems clear, from the literature shown above, that an emphasis on performance and/or results is meaningful, appropriate, and necessary. Von Bergen and Soper (1996) urge a balance of emphasis on both results and behaviors and against overemphasis on either one. Emphasizing results is appropriate when employees are skilled in their behavior, when behaviors and results are obviously related, and when results are improving. Alternatively, emphasizing behaviors is important when employees are new [to the organization or the task] or poorly performing; when the relationship between behavior and the result it produces is not necessarily evident; when the result is long delayed; when the relevant behavior is socially sensitive; when poor results are due to causes beyond the employee's control; when changes in working conditions or procedures require different behaviors to meet performance expectations; and when able and willing employees are not meeting expectations. In summary, they suggest that "the critical word is focus, not ignore" (p. 7). In other words, there must be a balanced view of results and behaviors to ensure that long run objectives are met.

Application to the Study

This literature indicates that the subjects of customer identification (e.g., who is my customer?), personal results, creating results with others, measuring results, and seeing results as part of the organizational system are good points about which to learn more.

Summary

Based on this literature review, the researcher concludes there is a gap in the virtual organization literature, which this study can address. This literature addresses organizations that have all communication modes available, including their Internet-based ones. Generally, the literature does not explain how such organizations work.

In this study, there is a virtual organization that lost and restored its communications. Therefore, its contribution to the literature is to provide information about the ways the people produced their results in light of this communications situation. The interview questions and related probes, which flow from the other key topics, are specifically focused on that contribution.

CHAPTER 3. METHODOLOGY

This study examines the affected persons' decisions and actions that resulted from the Division's loss and restoration of its Internet-based communication, an unusual situation. This chapter outlines the researcher's role in the organization and the organization case study approval process. It proceeds to describe and provide the rationale for the study's methodology, design, population sample, interview protocol, and data analysis. It concludes by indicating that all these items are appropriate for this situation.

Researcher's Role in Organization and Organizational Case Study Approval

At the outset of this study, the researcher was one of the persons assigned to the Division. He received approvals to proceed with the study from both the Division Director and the Deputy of Acquisition and Business Management. The Division Director granted her approval orally. In contrast, the researcher made a presentation to the Deputy, which outlined the study and sought approval. The Deputy granted approval and expressed an interest in the outcome of the study. Without these approvals, the researcher would not have been able to execute the study effectively.

From the time of the approvals until the present, the Director was reassigned to another office, placing the researcher into the Director's position (until he left the Division). Any complexities from this assignment have been mitigated by the fact that the researcher conducted the interviews after his departure from the Division.

The actual interviews were completed after the researcher's departure, in order to ensure that the participants understood that they were interviewed voluntarily as is envisioned by the protocol. Some persons left the Division and some new ones arrived. This situation means that the departed persons may more readily decide not to participate. The new persons were not interviewed because they had no direct experience with the situation.

Description of Methodology

This portion of the chapter provides the rationale for the case study methodology as well as for the data collection process.

The Case Study Itself

This case study is an inquiry into the participants' responses to the communication loss and restoration in a particular U. S. Navy Division. Their actions are embedded not only in the particular Division, but also in the Navy organization as well. Therefore, the study is classified as "multiple embedded cases" (Yin, 1994, p. 51) and "particularistic" (Merriam & Simpson, 2000, p. 109).

In this situation, the case study methodology is appropriate because

1. It focuses on the "how" and "why" questions, which are meaningful (Simon & Francis, 1998, p. 32 and 38; Yin, 1994, p. 1; Merriam & Simpson, 2000, p. 108).
2. The case is a bounded, integrated system that leads to a holistic description and interpretation (Merriam & Simpson, 2000, p. 108).
3. It is an organization and management study (Yin, 1994, p. 1).
4. It is being accomplished as a dissertation within the broadly defined professional fields of business administration and management science (Yin, 1994, p. 1).

refreshing the individual's memory and providing factual data for the study. Such documentation could include personal schedules, e-mail account data, and cellular phone usage.

The personal interviews were conducted with those persons affected by the change in communication. A complete explanation of the people interviewed is found below in the Sample and Population section.

Direct Observations

The researcher's direct observation and experience are valid sources of evidence for this study (Yin, 1994, p. 93; Merriam & Simpson, 2000, pp. 109–110). This source of evidence is covered in the next section on participant observation.

Participant Observation

The researcher. As noted in Chapter 1, the researcher was a staff member in this Division during the time of the loss and restoration of its Internet-based communication. As such, he is a participant observer (Yin, 1994, p. 87; Jorgensen, 1989, pp. 13–14). Specifically, he is a complete participant (Junker, 1960, pp. 35–36) or an insider (Jorgensen, 1989, pp. 60–61) because he directly experienced the situation.

In this study, the data used by the researcher in his role of complete participant is extremely limited. He did not decide on this study's topic until early April 2002, after the external communications were restored and just as the internal network communications were restored. Consequently, he has no notes of his experiences as would be available had the topic been determined before the communications were lost. Nonetheless, his position yields several valuable assets:

1. His membership's privileged point of view (Jorgensen, 1989, p. 63). As a complete participant, the researcher was as directly affected by the loss and restoration of communications as each one of the participants.

2. The participants' trust. He has known these people and they have known him for varying lengths of time (i.e., from 1 year to 20 years); in his view, all have known him long enough to trust him. This level of trust yielded their cooperation and higher quality data for the study (Jorgensen, 1989, p. 69).

3. His own reflections on and perceptions of the experience. It is understood that these reflections and perceptions are filtered and limited by the passage of time since the loss and restoration events. However, they serve, when coupled with his ideas on goal alignment (Callaway, 2002), as the basis for the study's topic, research questions, and interview questions.

Other participants. Junker (1960) observes that, when a complete participant emerges to report, the whole group or some of its individuals may view him as either a spy or a traitor (p. 37). The researcher believes that the following aspects of this situation mitigate this risk:

1. He trusts the participants and he believes that they trust him to be focused on the study, remain true to his word concerning non-disclosure as outlined on the Informed Consent Form, and not to betray them.

2. Their participation is completely voluntary. They can simply refuse to participate in any or all parts of the interview.

3. The time differential between the events and interviews in October 2002 is such that precise details are most likely forgotten and only general conclusions remembered.

4. He has left the group and is not seen as any type of work-related threat.

Physical Artifacts

This type of evidence includes such items as “a technological device, a tool or instrument, a work of art, or some other physical evidence.” These items may “have less potential value in the most typical kind of case study” (Yin, 1994, p. 90).

The researcher believes that this study is one of those in which physical artifacts were not sufficiently available or useful for providing information. As noted in Figure 3, during the time in which the external communication was lost, internal network communication was possible. When the external communication was reestablished, internal communication was lost for a short time. As noted above, it was not possible to obtain information about the participants’ internal network computer usage from the network servers during the time of the lack of communication.

Design of the Study

The Study Itself

Yin (1994) suggests a number of things to ensure an effective case study. The study needs to

1. Have a theoretical basis (p. 27).
2. Address five components of a case study research design. The components are (a) the study’s questions; (b) its propositions, if any; (c) its units of analysis; (d) the logic linking the data to the propositions; and (e) the criteria for interpreting the findings (p. 20).
3. Assess quality (pp. 32–38), through the four common tests of social science methodology—construct validity, internal validity, external validity, and reliability.

Theoretical Basis

This study's underlying theoretical basis is that organizational results are the product of all organizational members' work-related interpersonal relationships and work processes, as outlined in Chapter 1.

Five Components

This study design addresses all of Yin's five components of an effective case study.

First, the question is noted in the study's purpose, which is to determine the organizational effects and results, from the participants' point of view, related to SBM's loss and restoration of its Internet-based communications.

Second, the study's propositions are found in Chapter 1.

Third, its units of analysis, as noted above, are the individual persons in the Division.

Fourth, the logic linking the study framework with the data is illustrated throughout the study. For example, Chapter 4 and Appendix B relate the Appendix D Effects to the theoretical framework.

Finally, the evaluation criteria, which demonstrate success, are the ability to determine in what ways (a) the researcher's conclusions are supported by the data and show ideas for future work; (b) the completed tables led to themes that provide insights and ideas for future work; (c) the particular probes were useful in obtaining insights for future work; and (d) the documents, archival records, physical artifacts were helpful in providing meaningful supplemental information for the participants and the researcher and were useful in obtaining insights for future work.

Quality Assessment or Trustworthiness

Yin (1994) indicates that design quality is assured by the use of the four tests frequently used in social science research: construct validity, internal validity, external validity, and reliability. Lincoln and Guba (1985) provide two ideas that are appropriate for this qualitative study. The first idea is that the trustworthiness tests used in qualitative studies are credibility, transferability, dependability, and confirmability, which are “the naturalist’s equivalents for the conventional terms [outlined by Yin]” (p. 300). The second item is their Summary of Techniques for Establishing Trustworthiness, which is replicated below.

Table 1. Summary of Techniques for Establishing Trustworthiness

Criterion Area	Technique
Credibility	(1) Activities in the field that increase the probability of high credibility (a) prolonged engagement (b) persistent observation (c) triangulation (sources, methods, and investigators) (2) peer debriefing (3) negative case analysis (4) referential adequacy (5) member checks (in process and terminal)
Transferability	Thick description
Dependability	The dependability audit, including the audit trail
Confirmability	The confirmability audit, including the audit trail
All of the above	The reflexive journal

(Source: Lincoln & Guba, 1985, p. 328)

The researcher addressed each technique in this study as indicated in the following discussion, which is based on Lincoln and Guba (1985). As the techniques are addressed, it is important to remember the key aspects of this study, which are (a) the participants work in an office with ongoing responsibilities and work to be accomplished. Their time is valuable and

their assistance is at the expense of their completing other work. In addition, the researcher promised the organization's management that there would be a minimum of disruption to the office's operations; (b) the sole researcher is accomplishing this study as a doctoral dissertation. Therefore, some research ideas outlined below are not possible; and (c) the researcher promised confidentiality to the participants, as an essential part of the interview. Part of the confidentiality is the eventual destruction of interview data, including transcripts. Therefore, retention of certain records is impossible.

The Lincoln and Guba (1985) note that "prolonged engagement" is "the investment of sufficient time to achieve certain purposes: learning about the 'culture,' testing for misinformation introduced by the distortions either of the self or of the respondents, and building trust" (p. 301). They indicated that the length of time is "relative to the context's scope and sophistication" (p. 302).

The researcher was a member of this Division from August 2000 until August 2002. He was a member of ABM (and its predecessor organizations) from December 1984 until August 2002. During this time, he gained insights into the culture and built trust with the participants (as noted elsewhere). Reaching conclusions based on information from several participants minimizes the potential distortions of self. During the interview process, the researcher did notice that a small number of the participants might have been engaging in activities that could lead to distortion of the findings. For example, one participant indicated that she thought the researcher was only looking for things that went wrong (potentially to assign blame and responsibility). He immediately assured her that the critical matter was her experience, her story, and the individual events as she experienced them. From that point forward in the interview, she

seemed as open as she had been earlier; frankly, her comment was surprising to the researcher. Her information was included in the coding and events because there was no reason to exclude it. Two other participants took on the role, during part of the interview, of being a “hero,” a “man in control of the office,” or a “person who knows everything about every detail in the office.” While this role was not played long, it was very clear when the person was engaged in it. As with the other participant, their information was included in the study because the role-play did not disrupt their story, which was consistent with the researcher’s experience with these people, and there was no reason to exclude it from consideration.

In the words of Lincoln & Guba (1985), the term “persistent observation” means to “identify those characteristics and elements in the situation that are most relevant to the problem or issue being pursued and focusing on them in detail.” The authors continue by indicating that the researcher must focus on “those things that really count”; they caution, “the naturalist must be able to recognize when the atypical may have importance” (p. 304).

The study’s theoretical framework provided an excellent method of focusing on the critical aspects of this situation, which are delineated in Appendix B. There are several ideas, which are atypical and the researcher believes have significance. Those ideas relate to the group’s identity and the amount of trust in the group, both of which do not manifest themselves frequently in the interviews.

The discussion of triangulation addresses the four different triangulation modes: different sources, methods, investigators, and theories. Source triangulation can be both “multiple copies of the same source (such as interview respondents)” and “different sources of the same information” (Lincoln & Guba, 1985, p. 305). They indicate that “the naturalist falls back on

different modes of data collection, using any that come logically to hand but depending most on qualitative methods” (Lincoln & Guba, 1985, pp. 306– 307). Triangulation by investigators is somewhat problematic because of the nature of naturalistic inquiry. It can be reasonably accomplished if a team of investigators is used and there is sufficient intra-team communication to keep all investigators “honest” (Lincoln & Guba, 1985, p. 307). Finally, the authors state, “the use of multiple theories for the sake of triangulation is a formulation that the naturalist cannot accept” (Lincoln & Guba, 1985, p. 307). This posture is based most critically on the idea that “facts are theory-determined; they do not have an existence independent of the theory within which whose framework they achieve coherence” (p. 307).

In this situation, the researcher is able to reach conclusions based on triangulation of sources, specifically interviews. There is some limited information available on key aspects of the Division’s operations (e.g., budgets and some meetings); therefore, some triangulation by methods is possible. The researcher also performed a triangulation by work cluster and gender, which is based on the code words and not the individual effects. This activity is discussed under the Data Analysis element of this chapter. It is not possible to perform either triangulation of investigators because there is only one researcher or triangulation of theories for the reasons Lincoln and Guba state.

Peer debriefing is the “process of exposing oneself to a disinterested peer in a manner paralleling an analytic session and for the purpose of exploring aspects of the inquiry that might otherwise remain only implicit within the inquirer’s mind” (Lincoln & Guba, 1985, p. 308). The researcher has been able to have routine debriefings with his dissertation mentor and one of his committee members. In addition, his wife has provided valuable insights to the process because

of her experience with the larger Navy culture and her detachment from the experience being studied.

Negative case analysis is “a process of revising hypothesis with hindsight.” Its object is “continuously to refine a hypothesis until it *accounts for all known cases without exception* [emphasis in original]” (Lincoln & Guba, 1985, p. 309). The researcher made no attempt to create hypotheses nor, certainly, to account for every reported individual effect. The Effects noted on Appendix B are, however, the researcher’s assessment of the central idea that is holding the individual effects together, as shown on Appendix E. A detailed explanation of the connections among Appendices B, D, and E is found in the Data Analysis element of this chapter.

By referential adequacy, Lincoln and Guba (1985) mean “a means for establishing the adequacy of critiques written for evaluation purposes under the connoisseurship model.” Their illustrative examples include methods such as providing videotapes or other records of events (such as classroom life) to a repository for future analysis by other persons (p. 313).

The researcher’s confidentiality agreement with the participants precludes depositing any recordings, transcriptions, or other files that make individual identifications in any repository. The only records available are Appendices to this dissertation.

Regarding the member check, Lincoln and Guba suggest: “The member check, whereby data, analytic categories, interpretations, and conclusions are tested with members of those stakeholding groups from whom the data were originally collected, is the most crucial technique for establishing credibility” (p. 314) Further, they indicate that such member checking can be accomplished on a formal and informal basis as well as during and after the data collection.

The researcher's member checking process was accomplished through two briefings described below.

The researcher briefed one of the participants on November 20, 2002. This participant is one of the persons in the Front Office Leadership work cluster. This participant is important to the member checking process because he was both a customer of the Division's products and part of the Division's process. In addition, he is key person responsible for moving ABM to the Pentagon in spring 2003 as well as a key civilian leader in the organization. (The civilian employees look to him for long-term career advice and counsel.) This briefing provided the complete list of effects as a single list and as a set of categories aligned with the key aspects of the situation. The briefing was provided to him before the meeting in order to give him time for thought and reflection. The briefing was a pleasant conversation.

The participant agreed with the Appendix D Effects listing; there was no addition to or subtraction from this listing. During the briefing, only two questions were asked that could affect the study. The first related to the amount of customer information sought by my interviews. The response came in three parts:

1. Customer information was obtained from the participants in the Front Office work cluster. These persons fall in the same dual role category—customer and process participant.

2. Hearsay customer information came from the participants as they addressed the Interview Questions, in particular, Questions 4 and 5 concerning personal and organizational results.

3. No specific attempt was attempted to contact the Division's outside customers (in the various Department of the Navy commands, in other Department of Defense activities, or in

commercial partners) because (a) contacting them is outside the scope of the study, (b) their number is too great and unknowable and (c) any sample would be misleading.

The second question related to the Effect concerning management not fulfilling its responsibilities to provide proper tools. This question related to the other participants and if these persons meant, "management did not fulfill its responsibilities" or "given the reality of the loss, management did not permit them to adjust their work processes, locations, and anything else needed to get the work accomplished." The answer was the former. In fact, based on the researcher's experiences (both as a complete participant and an interviewer), it was clear that management (including this participant) was very open to allowing the individuals do what they needed to do to complete the work.

As a result of this briefing, the researcher did not change the Appendix D Effects listing.

On November 26, 2002, the researcher briefed a group of three persons, two of whom were participants and the third was not. (The third person is currently the Division's Director, the position the researcher left in August 2002). The briefing was similar to that used earlier. It contained Figure 4 and the Interview Questions for the benefit of the third person (the non-participant). Since the two participants had already seen the Figure and Questions, they served as reminders. In addition, it contained a pair of charts that focused on gaining an understanding of "underlying glue" that holds the whole study together. It was the researcher's point of view that this "glue" was restructuring. Specifically, that the communication loss (in particular) and restoration events caused a restructuring of the Division, especially in the work-related interpersonal interactions. The briefing was another pleasant conversation.

The briefing's results were

1. The group agreed that the Effects listing was “exhaustive.” By that term, they meant (as did the earlier participant) that the Appendix D Effect list captured all the Effects, did not miss any, they could add no Effect, and no Effect on the list ought not to have been there.

2. They did not agree with the idea of restructuring as the “glue.” They agreed that the idea of “paradigm change” was the “glue.” Their point of view was that people (as individuals and as a group) learned that effective work could be produced from any number of places. In other words, the paradigm shift was from a one-location worksite to a many-location worksite.

In response to the comments from both briefings, the researcher used the Appendix D Effects list the baseline for the study’s results.

Lincoln and Guba (1985) indicate that the naturalist can assist others in transferring his conclusions to other contexts by providing a thick description of the situation. The transfer, though, remains the responsibility of the person doing the transferring, not the researcher. The definition of a “proper” thick description is “still not completely resolved.” They conclude with the idea that it is the naturalist’s “responsibility to provide the *data base* that makes transferability judgments possible on the part of potential appliers” (p. 316).

The database of individual events is found in Appendix E.

A dependability audit is recommended as a meaningful method for establishing that the study meets the criterion. This audit process is similar to that of a financial audit whereby books and records are examined to determine if the financial statements reflect the organization’s operations (Lincoln & Guba, 1985, pp. 317–318).

In this case, because of the confidentiality agreement, this type of audit is not possible. However, since the material attached to the dissertation is complete, dependability assessments can be made on that basis.

Similarly, a confirmability audit is recommended as a meaningful method for establishing that the study meets the criterion. This audit process is, again, similar to that of a financial audit in which books and records are examined to determine if the financial statements reflect the organization's operations (Lincoln & Guba, 1985, pp. 318 – 319).

Likewise, confirmability assessments, through an audit, would have to be made on the basis of the dissertation itself.

Finally, a reflexive journal is used as a method of capturing the researcher's ideas, as the study progresses, in order to validate the eventual findings. This journal is "a kind of diary, in which the investigator on a daily basis, or as needed, records a variety of information about *self* (hence the term 'reflexive') and *method*" (Lincoln & Guba, 1985, p. 327).

The researcher kept a reflective journal, which meets the requirements of reflexive journal as described by Lincoln and Guba. However, it is limited because the researcher is an action-oriented person. When he has an insight, it is recorded in a number of places such as, the reflexive journal, the material that caused the insight (e.g., the draft listing of effects or Chapter draft), or reference material. In any event, some of the journal entries are directly related to participants' interviews and ideas; as such, they are subject to the confidentiality requirement. As a result, the existing journal has not been very helpful in creating the listing of effects found in Appendix B.

The key issue in the data gathering portion of this study is the time differential between the events and October 2002, when the interviews were conducted. The researcher took no significant overt or covert action to prepare potential participants for the interview, until early July 2002 (with the exception of obtaining approval to proceed addressed earlier). He addressed most of the potential participants at this time because he was soon to leave the Division, because he wanted to explain to them what he would be asking of them and why, and because he wanted to alert them to the need for other sources of evidence (such as personal cell phone bills). He did not make this request earlier for the following reasons: he was not certain of the study topic until after the communication restoration; he did not want to influence work relationships and results; and he wanted the individuals to be free to participate or not to participate, as they believed was in their best interests. This freedom may have been compromised in some participants' view if the researcher was simultaneously their supervisor and a researcher. (Junker [1960] describes this simultaneity as part of the participant observer ethical problem.) While this decision is somewhat risky in terms of data gathering, it helps to maintain participant control of the interview.

Sample and Population

There were 21 persons from the SBM Division and the ABM Front Office, who had information about the communication loss and restoration situation. Of this group, one is no longer associated with ABM and has physically moved out of the area. Therefore, 20 persons in the SBM Division and the ABM Front Office were offered the opportunity to participate in the interviews.

Eighteen persons were interviewed. One person declined to participate. The last individual left the SBM Division in December 2001; while she expressed interest in and the desire to participate, she could not make appropriate arrangements to do so. Chapter 4 contains specific information about the interviews.

Instrumentation and Protocol for Data Collection

This element outlines the study data collection plan, the interview question pilot testing process, and a conclusion.

Protocol for Data Collection

Yin (1994) indicates the importance of having a multifaceted protocol, which includes not only “the instrument but also contains the procedures and general rules that should be followed in using the instrument” (p. 63). He continues by suggesting that the protocol needs to contain a case overview, field procedures, case study questions, and a case study report guide.

These requirements are fulfilled in this study in the following manner. A step-by-step protocol is found at Appendix A. It includes a description of the interview process, a sample interview invitation letter, a sample participant Business Information collection form, a sample Informed Consent Form, the set of interview questions with related probes for the researcher’s use, and the set of interview questions themselves to be given to the participant as the baseline for the interview. This protocol meets Yin’s field procedures and case study questions requirements: this dissertation meets the overview and case study report requirements.

The process for obtaining data consists of three major components. The first is personal interview data, revealed by the participants. The second type is data collected from the Division itself, including material such as a charter, set of accomplishments, and file server statistics. The

third type is data provided by participants, as they believe there is a need, to refresh their memories or to confirm their statements.

The interview questions, including the probes, are found in Appendix A. The probes have been generated as a result of the literature review and are focused on the study's purpose and objectives. They are used to ensure that the participant is offered the opportunity to discuss the study's critical items.

The researcher conducted the interviews on a one-on-one personal face-to-face basis. They were audio recorded to ensure that the researcher maintains human contact with the participant and all the ideas are captured. The researcher obtained information concerning the participant's experience and actions. He did not seek information about interview interactions between the participant and the researcher, such as power shifts in the conversation. Detailed transcripts were made for coding, analysis, and presentation purposes. The transcripts and presentation are subject to the restrictions found on the Informed Consent Form.

Each interview was based on the same protocol with no variation in the questions or probes. Variation in the interviews occurred, based on ideas expressed by the participants and related follow-up questions.

The required documentation will be gathered from the Division's files and computer hardware. This documentation includes things such as the Division's charter, budget records, and e-mail traffic.

As noted in Chapter 1, the specific research questions were

1. In what ways did the participants experience the loss and restoration of Internet-based communications?

2. In what ways did the Internet-based communications loss and restoration affect the individuals' results?

3. In what ways did the Internet-based communications loss and restoration affect organizational results?

4. In what ways do you see organizations, in general, or society, as a whole, affected by Internet-based communications loss and restoration?

The precise questions posed to the participants were

1. In what ways did you, as an individual, experience the loss and restoration of the Division's Internet-based communications?

2. In what ways did the loss and restoration of the Division's Internet-based communications affect your work-related interpersonal relationships?

3. In what ways did the loss and restoration of the Division's Internet-based communications affect your personal work process?

4. In what ways did the loss and restoration of the Division's Internet-based communications affect your personal results?

5. In what ways do you believe that the loss and restoration of the Division's Internet-based communications affected the Division's results?

6. In what ways, if any, do you understand these loss and restoration events to have any meaningful impact on organizations, in general, or society, as a whole?

7. Is there anything else that you would like to tell me about your experience in this situation?

The relationship between the research and interview questions is as follows.

Research question 1 is directly related to participant interview question 1. Research question 2 is directly related to participant interview questions 2, 3, and 4. Research question 3 is directly related to participant interview question 5, which relates to Divisional results. Research question 4 is directly related to participant question 6, which concerns the future. The participant question 7 is included because it provides the participant the place to relate whatever he or she chooses about the situation, including that which has not been addressed previously.

This order is reasonable because, in the researcher's view and experience in this culture and with these participants, the line of questioning follows the logic of their thought processes. They focused (a) on what they did (their relationships and process) (b) to obtain results and (c) within the organization. The interview questions themselves are reasonable because question 1 helps establish rapport between the participant and the researcher; questions 2, 3, 4, and 5 focus on the loss and restoration events, which are the heart of this study; question 6 seeks the participants' ideas, which may be useful for Chapter 5 or for future work; and question 7 is simply an open-ended question that allows the participant to say whatever is on his or her mind.

The participant questions with their related probes are found in full in Appendix A. The probes are based upon the literature review and are intended to obtain information related to the participants' experiences.

The use of human participants in research was understood and approved by the University when it approved the dissertation proposal, which included the required disclosure at Appendix A. Further, all interviewed persons signed the Informed Disclosure Form found at Appendix A before the interview.

Pilot Test Process

Study Concept

The researcher conducted numerous tests of the study concept itself. The first test was made when the Deputy gave the researcher approval to proceed with the study, which authorized the participants to cooperate as needed and within reasonable bounds. The Deputy was interested in the study because the organization is scheduled to move into the Pentagon from its current location in spring 2003. This change will limit the number of persons who can enter or use ABM's physical location for work. Consequently, ABM will become even more dependent upon technology-based communications than it was earlier.

The researcher conducted three additional tests by informal conversations with specific persons in May and July 2002 (the researcher knew these persons on a professional basis). All three individuals were, at first, surprised that this Division had lost its communications for the extended period. They asked questions about the origins of the loss and the methods for communicating during the time period of the loss: finally, they thought that obtaining information on the communications loss and restoration would be useful and have some valuable insights for business operations.

Interview Questions

The researcher tested the interview questions on June 24 and June 26, 2002. The first test was made with a person who was not part of the Division at the loss of communications, but was at the restoration. Accordingly, he is not considered to be in the population; however, his insights are critical to the study. The second person, during the time under study, was one of the

Division's customers. He, too, is not in the study population. His insights were critical because he experienced the loss and restoration from a different point of view.

The results of the testing concluded the following:

1. The protocol was acceptable as written for the purpose of outlining the interview process as well as assuring that the participants understand the voluntary nature of the process.
2. Minor adjustments were needed in the wording of the interview process, interview invitation letter, participant business information, and informed consent form. These adjustments related to the use of the term "audio recording" in lieu of "tape recording" to reflect the technological solution for recording as well as ordering of the business information items.
3. The interview questions themselves were acceptable. The first individual found that the questions were reasonable, flowed logically, and could be answered easily. However, the second individual took a point of view different from the researcher and emphasized the individual's work-related interpersonal relationships and work processes. As a result, he suggested a revision to the questions. After explanation of the researcher's rationale, he indicated that he found the questions to be reasonable, to flow logically, and to be answered easily.

While the researcher believes that this process accomplished its objectives, he acted on the second individual's ideas by emphasizing the recommended aspects more clearly. The result was the set of interview questions found in Appendix A.

Data Analysis Procedures

This element describes the researcher's process for interview transcription, transcription coding, creation of the Effects listing, and ensuring trustworthiness.

Interviews and Interview Transcription

Appendix A contains some lessons learned about the researcher's interviews; Chapter 4 contains information about the interviews, such as number of participants and length of interviews.

The personal interviews were audio recorded and professionally transcribed from those recordings (Boulton & Hammersley, 1996; Grinnell, 1997). Professionals were used due to time and skill constraints (Grinnell, 1997). The level of transcription was appropriate for the task (Boulton & Hammersley, 1996; Dey, 1993; and Arksey & Knight, 1999) and, generally, was verbatim.

The researcher obtained transcription service from a local company by a contract. A key contractual provision related to confidentiality of the transcripts and tapes provided by the researcher. This requirement was mandatory to ensure the interviews' confidentiality, as noted in the Human Subjects Form. This provision's essence was that the company would hold all material as confidential, would not reveal any material, and would destroy any transcript records it held. The company notified the researcher in writing on November 21, 2002 that all transcript documents and electronic files related to this study have been destroyed.

The company provided a paper copy of each interview transcription as well as an electronic version. The paper copies were held separately for reference, while the electronic versions were used for coding purposes.

Transcription Coding

The researcher used The Ethnograph 5.0 (hereinafter called "the software") as the qualitative data analysis tool (Grinnell, 1997). He based his decision on its capability, his need for (most likely) one-time use in this study, and educational pricing.

Every transcript was read initially to make it ready for importing into the software, which requires a particular formatting. For example, "+" must be added at the beginning of each major paragraph. In addition, the researcher found that a few portions of some transcripts were unintelligible to the transcriber; as a result, there were notations to this effect in the transcription. The researcher listened to the audio recordings to obtain clarity on these points. Based on his interview (he knew what was said) and his hearing the recordings, he was able to make some corrections in the transcript that allowed the additional data capture. A significant consequence of this reading and file manipulation was the ability to obtain an assessment of the coding task complexity (Boulton & Hammersley, 1996, p. 290) as well as a general idea about the codes to be used.

The transcripts were printed from software in the numbered version to permit hand coding of the file, called a code map by the software. The researcher used the full functionality of code words, segments, overlapping segments, nested segments, and code rules to capture ideas of interest. All segments were marked in relevant size (Grinnell, 1997; King, 1998).

The codes were based on two sources—the interview questions and related probes as well as ideas found in the texts themselves (Grinnell, 1997; King, 1998; Boulton & Hammersley, 1996). The code set began with the interview questions and related probes and grew to accommodate the discovered ideas with the purpose of generating as many codes as possible

(Boulton & Hammersley, 1996; Lincoln & Guba, 1985). A complete code listing is found in the Interview Protocol.

At completion of transcript coding, the researcher added coding to certain transcripts to capture ideas he missed at the earlier coding. The source of these codes was the notes he made as he performed the coding.

The result was the generation of 79 codes (or code words in the software's parlance).

Analysis Process

The primary purpose of the analysis process is to generate the Effects listing, found in Appendix B. This discussion describes that process.

Generating the Effects Listing

The researcher retrieved all the coded segments for each code word on a code word-by-code word basis. He reviewed each coded segment and placed it in a category. The results for each category included which participant's comment related to the category and the transcript line number at which the comment started. This annotation was used to ensure simple recovery if a particular coded segment were needed and to support the audit trails.

Each code word's category list was gathered and kept separate from every other code word category list. All lists were placed in a separate binder.

Specific segments of the transcripts (e.g., segments related to interview question 5 concerning organizational results) were reviewed to ensure the lists were as complete as possible.

Appendix C-1 contains an accounting for the numbers of codes and coded segments that were used in the subsequent steps. Fifteen code words and their related coded segments were eliminated from further consideration because they were irrelevant for the reasons that they did

not address the immediate study (e.g., they related to historical events) or they were code words used to mark transcript elements (Boulton & Hammersley, 1996). Consequently, there were 64 codes and 965 coded segments considered.

The individual categories were entered into a table, which led to an initial effects listing of 263 effects. (At this point, the categories became “individual effects”). The listing was then marked to annotate which question would be the most applicable for the particular effect. An example of one of the table pages is found in Appendix C-2.

The effects were sorted by question for grouping. There were seven groupings — one for each of six interview questions and one for “Other”. There was no effect for interview question 7 because no participant had anything else to add. The “Other” category was necessary because it related to those ideas discovered and added during the coding process. Appendix C-3 illustrates this step in the process.

From the list of individual effects of Appendix C-3, the researcher examined for themes, which provide logical groupings for the individual effects. This process led to an initial list of Effects (which was a predecessor to Appendix D). The researcher created Appendix E from Appendix C-3 by adding data about the number of participant comments related to each individual effect and a total. The purpose of this data is to provide a way of finding the significant individual effects and helping name the relevant theme. From the initial Appendices D and E, the researcher engaged in an iterative process of change that led to the attached Appendices.

It is noted that, during this process, a number of effects were classified as “significant items.” These items tend to be very personal to the participant and are significant in that they

contain an extremely vibrant picture of the individual's experience. For example, Participant R said the SBM Division was treated like "red-headed step children" by the people in ABM. This statement and similar comments are addressed in Chapter 4.

Individual Effects Listing

The individual effects listing found in Appendix E is the result of this analysis process. It has 263 individual effects, which are directly connected to the question from which they originated and broken down by Effect Numbers. Several individual effects are similar in content and are retained because they evolved from different category (or individual effect) data.

Triangulation by Work Cluster and Gender

The purpose of these analyses is to determine if they reveal any other ideas that shed light on the Effects or the individual effects. Appendix I is included to assist with the interpretation of Appendices F, G, and H because these three Appendices are focused on code words and not on individual effects or Appendix D Effects.

The first analysis is based on the data in Appendix F and compares the number of coded segments by code word for the various work clusters. The 21 code words were selected because they all had at least 10 or more coded segments in at least one of the work clusters. This number was selected in order to strike a balance between the need to focus on the things that count but not missing the atypical (Lincoln & Guba, 1985, p. 304).

There were 11 code words (annotated by the X in the last column), which showed sufficient variance among the work clusters that the researcher read all the coded segments associated with these code words to ensure that all the ideas were captured. All the differences

could be explained in terms of the work situation for the work cluster. The analysis did not provide any new information.

The researcher conducted a similar review for code words and the connection with gender, as noted in Appendix G. In this case, the researcher performed a series of per capita calculations and compared the developed amounts by establishing ratios between the two per capita results. There were nine ratios (annotated by the X in the last column) in which either the Male to Female Ratio was 2.0:1 and more or the Female to Male Ratio was 2.0:1 and more.

The researcher examined all the coded segments related to these code words to ensure all the ideas were captured. All the differences could be explained in terms of the work situation for the individuals. The analysis provided no new information.

Final Effects Listing

The final Effects listing is found at Appendix B. It is the result of the following actions:

1. The participants' comments at briefings that the list was "exhaustive."
2. The researcher's conclusion that, since some of the Effects are similar, they would be combined, without losing the sources of the individual effects. Therein lies the difference between Appendices B and D.
3. The analyses by work cluster and by gender. These analyses show that any differences in coding among the groups relate to the work situation and do not hide any individual effects.

Assessing the Probes' Usefulness

The researcher took the existing list of code words and related coded segments and sorted it by code word. The researcher eliminated those code words that did not relate to any question

or probe. The resulting table is found at Appendix H and includes 36 relevant code words and 682 coded segments.

Conclusion

Based on the analysis found in this chapter, the researcher believes that the selection of the case study methodology is sound; the protocol is sound and collected useful data; and the data analysis procedures are sound and appropriate for the work to be accomplished. Therefore, the researcher concludes that the methodology provided sufficient useful information for the study.

CHAPTER 4. PRESENTATION AND ANALYSIS OF DATA

This chapter presents the effects derived by the researcher and analyzes them. The analysis is accomplished within the context of the study's theoretical framework. That is, the effects are grouped and analyzed as they illustrate the framework's aspects. In addition, there is information related to the individual effects that could not be aligned with any particular effect. Finally, there is an assessment of the probes' usefulness.

All effects have been numbered in both Appendix B and Appendix D. The difference is that Appendix D contains the full initial list of effects, while Appendix B contains the list as adjusted to combine those effects having similar ideas. Appendix B was created for the sole purpose of having a simple, clear, and complete list for ease of presentation.

In the following discussion, the Appendix D numbering will be used for simplicity, consistency, and maintaining an audit trail for trustworthiness purposes.

Interview Data

Before considering the Effects and the related individual effects, the following information is provided about the interviews themselves. Appendix J contains some information related to the length of the interviews themselves related to the particular work cluster within which the participant works.

There were 18 participants interviewed. The total length of time for all interviews was approximately 8 hours and 30 minutes. As noted on Appendix J, they lasted from 3 minutes and 16 seconds to 47 minutes and 16 seconds. (The researcher was able to calculate these data because one of the audio recorders captured the files digitally, which allowed its accompanying software to measure file size in time as well as in kilobytes). The interviews were conducted in

the ABM and SBM work place, corporate offices, the Pentagon cafeteria, and two participants' homes. The first interview was held (approximately) September 30, 2002 and the last two were conducted October 23, 2002. Fifteen of the interviews were held between October 7 and October 17, 2002.

Appendix J contains three tables that sort the length of interview time data by time (i.e., length) as well as by work cluster. The purpose of this sorting was to determine if any particular anomalies existed in the interview lengths that would highlight the need for a review of coded segments or individual effects. As demonstrated on Page 1 of Appendix J, the three persons whose interviews were the shortest were those performing administrative functions; of these three, the two shortest were from the Front Office.

This outcome was not surprising to the researcher. These two persons were, very likely, some of the least impacted ones in the study. For example, when the researcher called to make an interview appointment, one of the participants had completely forgotten that SBM lost its Internet-based communication; she had to be reminded of the situation. In addition, during the interview, the researcher had to suggest one or two actions she might have taken (such as changing persons' e-mail addresses in her personal address book) in order for her to remember what she did. She did note, in the interview, that part of the reason she was so unaffected related to people moving into ABM workspaces and becoming easier to find as she went about her daily routine. In her words, "You all came up [to the fifth floor from the fourth floor] looking for computers to work on. So we found you often."

The researcher believes that the third participant's interview was of short time duration because she tends to be quiet in demeanor; had thought about the questions very clearly before

the interview and had concise and precise answers; and rushed to get back to her new work place (she moved in April 2002).

Other than these short interviews with the accompanying conclusion that “No Effect” is valid, the information on Appendix J does not reveal anything that needs to be reviewed further. The mixture of interview lengths is a function of the amount of revelation these volunteers chose to make.

The Study’s Theoretical Framework

Figure 4 is a graphic representation of the study’s framework. The Effects have been placed in groups following the framework’s seven elements because this approach provides a consistency of thought for the entire study. There are alternative placements, such as one related to the physical events that occurred. However, these alternatives do not provide consistency of thought.

Work Clusters

The participants’ relationships are described in the Chapter 1 element, Background of the Study. Specifically, the participants work in the “Front Office,” “Help Desk,” and “Division” functions. The five Front Office people perform leadership and administrative support functions. The three Help Desk people support some of the Division’s applications described in Chapter 1. The twelve Division people accomplish their assigned tasks, which generally support the activities described earlier as well as the ones that materialize from new or existing customers. Not all the people in these functions became participants; one person’s arrival was timed so that he did not experience the loss or restoration, and the other was not available to participate.

During the interviews, it became clear to the researcher that there are seven work clusters in these three functions. They include Front Office Leadership (2 people), Front Office Administrative Support (3 people), Help Desk (3 people), Division (12 people), Leadership (3 people), Administrative Support (3 people), and Division less leader and administrative support (10 people). The Front Office function was split because these persons perform dramatically different functions—leadership versus administrative support. The Leadership and Administrative Support work clusters are the combination of the leaders and administrative support people from both the Front Office and the Division. The last cluster is the Division people without the leader and the administrative support person.

Customer

Effect Number 14 on View of Customers

This element relates to the Division's customers. Appendix D Effect Number 14 is "There was no change in the way the people viewed their customers."

The comments indicate that there was no change in the participants' views; however, one individual was much more intentional about who received which e-mail.

The researcher's experience in the Division, from a position as a complete participant, indicates that this Effect is reasonable. The people were (and, most likely, still are) very customer-focused. This focus was due to a number of factors, such as

1. The fact that the systems' implementation overseen by the Division was occurring in the Navy commands. Therefore, the people in the Division had to be very sensitive to the others' needs and concerns.

2. A significant element of current-day Navy culture is to help the war fighter get the job completed. Support groups (such as headquarters operations) are constantly challenged to assist in this process. Therefore, the groups become customer-focused, though they do not always and immediately make these connections.

The fact that there were only 8 comments is not particularly disturbing. Six (Number 199) come from different participants or 33% of the total group.

Purpose

Some participants mentioned the idea of organizational purpose. The relevant segments were coded as *purpose* and *mission*. However, the ideas were not mentioned extensively and did not rise to the level of an Effect.

The Division's charter, during this period, did not change. However, the Deputy was in the process of changing his charter to update it as well as to bring this Division formally into his charter. The researcher has seen both charters and, in fact, was the primary author of the Deputy's updated charter. There was no significant difference between the two documents in terms of the work that the Division was to accomplish. It must be noted, though, that charters are written in a very general way to capture all required work in a few sentences.

In addition, the work accomplished by the people in the Division (including the participants) did not substantively change. Some additional work was added, but it only affected 4 (of 18) participants. Therefore, most participants would understand what they were doing and continue to make appropriate progress.

In light of this situation, it is understandable that many participants did not see any change in the organization's purpose and, therefore, would not comment on it.

It does, however, appear in some of their comments about the organization's identity, which are addressed later in Effect Number 24.

Goals

This element is similar to that of Purpose. A few persons mentioned the idea of goals, but it did not rise to the level of an Effect.

The organization did not have stated organizational goals, which were known by everyone in the group. It had goals related to specific activities known by the affected parties. It had goals concerning budget ("get the money obligated as fast as you can") and contracting ("make awards quickly"), but only the affected parties knew these goals. Because of the researcher's role as a complete participant, he was aware of this information.

It does, however, show up in some of their comments about the organization's identity, which is addressed later.

People

This portion covers Appendix D Effect Numbers 1 "The people experienced a range of emotions"; 4 "The people determined to succeed by getting the work accomplished"; and 24 "The question of 'Who are we?' became important."

Background

The people in the SBM work cluster have an interesting background, which the researcher learned during his time in the Division (as a complete participant). Specifically, there are 11 persons in the work cluster. The researcher knows their backgrounds to a limited degree (he has known some people for 25 years and others for approximately one year). In any event, he knows that nine of the eleven currently are or have been in positions of leadership, management,

or supervision. Some were military officers, some civilian managers, and some were both. In any event, he knows that this background influenced the way people responded to this communication situation.

Effect Number 1 on Participants' Experience

Effect Number 1 does not necessarily contain the largest number of individual responses, but certainly some of the most strongly experienced ones. The most significant individual effect felt was, as might be expected, one of frustration. The frustration manifested itself in a number of ways. Participant H indicated that he was frustrated because the loss added another hurdle to getting the work accomplished (and, by implication, without any particularly positive return). Participant K was frustrated because she had no control over the situation, the responsible parties did nothing (in her view), and she could not even tell her boss about the situation—he always wanted to hear solutions because he thought the communications were in the process of being restored. Finally, Participant M, because of his contractual relationship with the Division, was frustrated because the loss meant that he was not in the Division as much as he had been in the past; consequently, he lost routine, day-to-day access to his sponsor. Further, he believed that interpersonal relationships are critical to his performance and success; therefore, he was frustrated at not being able to see individual's body language as they interacted.

The depth of feeling was interesting as well. Participant F told the researcher that with her move into the Division at the restoration, she lost the instant messaging capability with which she had been working for the loss period. She experienced this lack of capability as “a blow to the gut”; at another point in her interview, she referred to the lack of this capability as “having her right arm cut off.” Participant K indicated that the entire situation including the loss and the

work needed to regain communications was “incredibly annoying and it was absolutely stupid, and it was ridiculous, and it was totally unnecessary.” Finally, Participant O gave an assessment that was quite stinging. He noted that “a lot of people lost credibility in my eyes,” “it [the loss situation]... just kind of changed my attitude,” and “it [the loss situation] ... left a bad taste in my mouth.” He concludes, “Technology is not the issue, but it’s more personality, and leadership, and things like that.” Participant R noted the exact same idea when she said, “the technical solution was easy. It was the political solution that was hard.”

Effect Number 4 on Participants’ Determination to Succeed

Effect Number 4 concerning the individuals’ determination to succeed captured some interesting ideas. In summary, the people decided that the loss had no effect on their sense of purpose, they were going to get the work accomplished (because they were mission focused), and they would do whatever was necessary to do so. They made this decision as individuals and as a group; the group decision was made without consulting one another—they simply did it.

Ten participants directly indicated that the loss had no effect on their sense of purpose. In addition, Participant E goes further by saying that his sense of purpose was heightened because since he began work just at the time of the loss, he had to work doubly hard—he had to learn the system as well as to learn how to accomplish work in a different scenario. Participant K indicated, “We were too efficient in coming up with Plan B...we solved it ourselves (which took management’s mind off the issue)...because we had the pride of getting our work done.”

Having made that determination to succeed, Participant K reported that a few people spent personal funds for e-mail access and cell phones to remain in contact. In addition, every participant reported that they moved or saw the people in new locations. The moves were to

other locations, such as the ABM offices on the fifth floor or corporate offices. Participant K's moving is the most striking of all, because she tried to maintain a functioning office on the fourth floor. She finally carried her "office around in a bag." More specifically, she said, "I had to carry my stapler, paperclips, all that kind of stuff because you can't go up [to the fifth floor] and rifle through someone else's drawers to find this stuff...that's just rude."

Effect Number 24 on Self-Identity

Effect Number 24 concerning the group's self-identity is complex, even though it is not mentioned frequently. The researcher believes that a short history is needed to help in more fully understanding this set of individual effects. The following information comes from his knowledge as a complete participant.

A Short History

The office was created and named in early 1998 (initial work began in late 1997) on the basis that it had a specific purpose—make Department of the Navy acquisition paperless by January 1, 2000. The office was to "go out of business" by March 31, 2000. It was staffed primarily by persons "on loan" from the Navy commands and with a few from ABM: its leader was given a new title, which was different from his ABM organizational one (a staff role) and was similar to titles of some persons with significant line responsibilities; the persons in the office came from the acquisition, contracting, and information technology fields; it had its own information technology support; its work was focused on Department of the Navy contract transactions; it budgeted and executed its funds separately; and it awarded its own contracts. This office was located on the fourth floor, while the leader and ABM was located on the fifth floor of

Crystal Plaza Building 5. In general, this office was a “stand alone” operation with a specific mission to accomplish.

As things evolved, the initial goal changed and the related date passed; in addition, new responsibilities were assigned to the Division that would require it to continue for many more years. In the meantime, the command persons returned to their parent commands; some became liaisons with the office, while others moved to different responsibilities. Organizational dynamics being what they are, the group eventually became part of ABM. At this time, the office was renamed Strategic Business Management (SBM) Division to note the change in responsibilities. However, the name change did not significantly impact the Division’s performance or its interaction with the rest of the staff: it continued to operate reasonably independently of the rest of ABM.

In the Department of the Navy environment, the Secretary’s office provides policy and oversight, while the commands implement policy and complete whatever transactions are needed for the Navy and Marine Corps to succeed. This Division’s situation put a strain on this line of thinking and decision-making. Specifically, SBM was a transaction-based operation, while the rest of ABM and the remainder of the Secretary’s staff was a policy operation. This logic caused even more struggling (especially in the budget arena) as the Division attempted to do its work.

Analysis of the Effect

Returning to the subject at hand—the self-identity—the reorganization made SBM part of ABM, but no effort was taken to cause the groups to bond. For example, some participants noted the perceived way in which ABM people treated SBM. Participant R believed that SBM was the “red-headed step child”; and Participant Q noted that the Division was called “the people under

the stairs” and the “forgotten people.” The researcher is certain that no malice was meant, but the perception was real. He believes that this perception is the result of how the Division was formed, the people in the Division behaved, and (to a degree) how they continued to behave until he left the Division.

Specifically, the Division was variously described as “the paperless office” (Participant C), “flexible.” (Participants K and R), and “high tech office” (Participant L). In addition, it was seen as an “eclectic” mixture of individual programs, managed by individual program managers, who did not really appear to have a sense of “being on the same team” (Participants B and O).

In the view of some participants, the change in work locations, brought on by the communications loss, forced the people to recognize that initially, SBM was a different organization, not integrated with the rest of ABM, and not really recognized as part of ABM. However, as the Division became more integrated by eventually receiving service from and having e-mail accounts on the same network, it underwent a “profound” change from being a separate, stand-alone function to being part of the larger organization (Participant J). Even though there was an organizational structure change as well as the communications restoration that lead to a “sense of permanency” (Participant Q), some persons still did not feel comfortable using facilities on the fifth floor.

Ultimately, this Effect seems to highlight the additional question, “What causes individuals to change their understanding and connection to an organization?” Certainly, the organizational structures were in place to make the change, but the sense of discomfort did not leave (at least by the time of the interviews).

Process

This element covers 11 Effects including the following: 9 “The people made and implemented new communications plans”; 12 “The people used alternative communication modes, such as e-mail accounts and telephones”; 13 “The people moved to new locations, which caused extra effort and time to get the work accomplished”; 18 “The office, as a system, was debated”; and 26 “The people created new processes.”

This element is divided into six parts to achieve a fuller perspective of the process changes that occurred. The six parts relate to management’s responsibility to provide tools and information, the participants’ moving and the consequences, creating new processes, various aspects of the changed communication, the Division’s functioning, and the office as a system.

Effect Numbers 3 and 7 on Management’s Responsibility to Provide Tools and Information

The participants took the view that management did not, in this case, fulfill its responsibilities to provide the tools and information needed to accomplish the work. That point of view is very clear in the individual effects in Effect Number 3.

Comments related to Effect Number 7, which addresses a lack of information, were received from three persons who were never effectively told anything other than to move to a different work location. For example, Participant G relates, “I felt it was kind of crazy to lose Internet connection...I wasn’t really sure what happened...we had to get temporary e-mail addresses...which some customers kind of looked at it like ‘why do you have an MSN account as opposed to what [you had in the past]’...I did not know what to say...so I [said]...this is just a temporary thing. I don’t know if I answered the question right.”

Effect Number 2 on the Participants Moving and Effect Number 13 on the Consequences

The individual effects found in Effect Number 2 say, in summary, “we moved to other work locations.” One interesting individual effect is Participant R’s assessment that this moving and, with it, obtaining alternative communication methods saved the Division’s effectiveness.

In Effect Number 13, a number of the Participants talk about running around to find other people. This extra work was necessary because the individuals with whom collaboration was necessary had moved to different work locations. With the extra work came extra steps in collaboration, resultant delay, and increased costs.

The restoration and the resulting move back to the Division’s work location had an opposite effect—people were more readily available and collaboration was not as difficult.

Effect Number 26 on Creating New Processes

This Effect is interesting because of what is not in the individual effects listing: specifically, a significant number of comments are not present. That situation results from the fact that most of the people were able to work at different work locations while using the same processes. For example, they continued to write e-mail messages, provide budget information, and award contracts.

In contrast, most of the comments on the first three entries in the individual effects list come from the Help Desk work cluster. This group was significantly impacted because, in its move, the individuals were located with the other persons with whom they worked extremely closely. Consequently, their ability to obtain answers and accomplish work quickly increased with this proximity and decreased upon return to the Division’s work location. Logically, these moves caused changes in work process.

One individual effect is insightful. It is the idea that the temporary fix became the permanent solution. Participant L indicated that, since the communications loss lasted so long (approximately 5 months), "We had gotten used to working around it." Accordingly, since the people (e.g., Participant O) had learned that they could get the work accomplished without being in the Division's workplace, they continued to come to the office, only when they had to be there.

Effect Numbers 9, 10, and 12 on Various Aspects of Changed Communication

In order to maximize the relevancy of this study, these three Effects need to be examined as a whole. Effect Number 10 indicates that persons created entirely different communications plans because of the communication loss, while both Effect Numbers 9 and 12 are related to specific actions the people took to accomplish work.

Effect Number 10 says that some people created a new communications process because their previous one depended upon e-mail and others coming to the Division office in lieu of going to the people. A group created a communications plan for the Navy Standard Procurement System team to use in communicating with the Navy commands. The instant messaging network was helpful to the Help Desk people as they proceeded to address questions from the system users. Others simply had to change names in their e-mail address books to communicate with the Division people. The essential idea, captured in this Effect, is that the communications loss forced persons to consider very carefully how they were going to communicate with others in the future.

Effect Number 9 really focuses on a small number of persons. However, these persons were asked to become a communications center, which is important work, but not the most

important work for them to do. For example, they were asked to print files (such as PowerPoint presentations) and hand-carry them to other people. They were asked to take e-mails sent to them on the internal (not internet connected) system, transfer them to an outgoing (an Internet connected) system, and transmit them to the recipients; they were asked to do the same thing in reverse. This situation occurred because of the loss of communication as well as having an insufficient supply of analog (i.e. telephone) lines to allow the others to do this work themselves (as they had previously). The affected persons performed this function because it was needed to get work accomplished; however, their skills and talents lie in other areas, which needed those abilities.

Effect Number 12 captures the idea, as has been noted elsewhere in the study, that people used alternative communication methods (other e-mail accounts, telephones, and cell phones) to ensure that the work was accomplished.

Effect Numbers 6 and 8 on the Office's Functioning as a Group or Team

These two Effects address the office's functioning as a group or team, without distinguishing between the two ideas, because the participants did not make any differentiation.

Effect Number 6 is focuses on certain persons' expressed need for face-to-face contact. The communications loss showed that face-to-face contact is needed primarily to deliver client or customer service. In addition, though, the consultants (in particular) felt a need for face-to-face interaction with the government people, in order to avoid "irrelevance." Capturing the essence of Participant R's idea, not being in the Division can lead to irrelevance because changes can occur so fast that not being available means that the individual has no part in the decision process, which can be problematic to their continuing assistance to the Division.

Effect Number 8 includes individual effects that use the term "team," but the real focus is on the changes in cohesiveness that occurred with the communication loss and restoration. The story, in this case, is quite simple. The communication loss drove people away with the resulting loss of cohesiveness. However, in that moving, the Help Desk people moved to the KPMG Consulting location that allowed them to be closer to the rest of their work group, with the resulting increase in cohesiveness. With no one (or, at least, very few people) in the Division office, those that remained felt that there were no relationships. At the communications restoration, many of the people returned to the office, which led to an increase in cohesiveness. There is some difference of opinion on this last point, which the researcher believes, is based in the fact that not all the participants returned to the office.

The most significant item in this group of individual effects is the one that indicates that it is possible to be effective from a distance and get the required work accomplished.

Effect Number 18 on the Office as a System

The responses "Yes," "Maybe," "No," and "I don't know" can summarize the individual effects connected to this Effect. The researcher was surprised to see this Effect in the data. This Effect is one on which it may be difficult for the participants to agree. The difficulty could arise because the office as a system addresses an idea, which requires a good deal of reflective thought.

Technology

Effect Number 20 on Business Continuity Planning

This element addresses Appendix D Effect Number 20 "The people recognized the need for and importance of business continuity plans."

The two individual effects with the largest number of participant comments say the same thing, which is “We had a bad experience. Do not repeat it. Business continuity planning is essential and can avoid such situations.” In addition, they note that this type planning is critical to operational continuity. For example, after reading the question during the interview, the first words from Participant M were “Continuity of business. Absolutely critical.” Similarly, Participant K indicated that people used personal cell phones and that she was able to use her supervisor’s cell phone to provide phone connections when the individuals were not in the office.

The Division had a business continuity plan in place even though it did not recognize it as such. Its unstated, but thoroughly implemented, plan was for everyone to move and to use alternate e-mail accounts (both of these actions are discussed elsewhere). It is important to recognize, though, at this juncture, these alternatives were fundamental to the Division’s successful continuation and contribution. For example, Participant I said “...you...have some kind of second source...that’s the thing that saved us...if we wouldn’t have had those [other] accounts, it would have been over. It would have flat been over.” Similarly, Participant K indicated, “...if we had not had our support contractors who did have places to work and who could get e-mail at their regular places, we would have been totally out of commission.”

The researcher notes that, in this element of the framework, there is only one Effect and that the Effect most directly relates to planning and having second sources of communication modes—not the operational aspect of the work. In other words, the people addressed actions to be taken to ensure the situation is not repeated. This outcome is logical given the facts that restoration had occurred about six months before the interview; there was nothing most of the

participants could have done about the situation in any event; and they know that operational continuity is critical, even if no planning had been accomplished or executed (as in this case).

Nonetheless, some participants recognized the dire consequences that might have occurred if alternative sources had not been used. It is still important to recognize that if a business continuity plan had been in place, which supported the communications as designed, the process and team perturbations (noted elsewhere) may not have been experienced.

Results

This element covers Appendix D Effect Numbers 11 “The people had to do extra or non-programmatic work, which increased costs.” 15 “There was no change in the way the people assessed results.” 16 “There was increased time and delay to get the work accomplished.” 17 “Key aspects of the office’s functioning continued unabated.” 19 “The office’s ability to deliver results was debated.” and 25 “Work quality was not affected.”

This situation is best described with a different arrangement of the effects. Essentially, the participants did not assess their results any differently than they did in the past, than if they would have had full communications, and than they anticipated in the future. Further, there was no change in the results assessments methods they used. It is noted that the only quantitative measures were those used by the people in the Help Desk work cluster. The budget and contracting records capture completions only, without any information about in-process time. There were no other specific measures.

From this base, the story continues with the assessments that the office’s key functions continued; but, a price was paid in terms of image, time, and cost.

Effect Number 15 on Results Assessment Methods and Effect Number 25 on Work Quality

The information related to Effect 15—results assessment methods—and Effect 25—work quality—found in Appendix E. speak for themselves.

Effect Number 17 on Unabated Operations

As noted by Effect 17, the participants worked diligently to ensure that the required work was accomplished. The budget was executed on schedule based upon Participant O's assessment as well as the financial data he provided. These data indicated that the budget was executed as soon as the funds were available in both Fiscal Year 2001 (October 2000 until September 2001, before the communication loss) and in Fiscal Year 2002 (October 2001 until September 2002, which includes the communication loss period).

The contracts were awarded on schedule or as needed based on information from the Contracting Officer.

The researcher concluded that the Integrated Process Team (IPT) meetings were conducted and related systems continued operation, based upon information from Participants L and R, from presentations made at the IPT meetings from April 2001 until October 2002, and from Navy Air Force Interface (NAFI) system operational statistics. For example, the IPT opening presentations show the meetings' agendas, which consistently include discussions on user and system statistics, trouble tickets, and scheduling for the next meeting. These agendas also cover issues sensitive at the particular point in time. In addition, the NAFI statistics show a 29 "trouble ticket" decrease (approximately 23%) from November 6, 2001 with 127 "tickets" to April 2, 2002 with 98 "tickets."

Participant R attributes this success to “alternative ways of communicating with people” and continues with the determination and alternative communication methods noted elsewhere “the business of the office continued in all ways, whether it be the development of applications, the maintenance of applications, or IPT meetings.”

Effect Number 19 on Delivery of Results

Effect 19 takes a different perspective on the results assessment situation than Effect 17. The difference lies in the fact that Effect 17 tends to focus on concrete outputs (such as contract documents or meetings held) while Effect 19 tends to focus on interpersonal connections. Effect 19 contains a number of individual effects that show differences of perception on the part of the participants. Those differences are not surprising because they reflect each individual’s experience with customers and their perceptions of those experiences. In addition, some of the individual effects are based on personal conclusions and personal beliefs of “how this office is supposed to operate.”

The key individual effect in this group relates to the Division’s damaged image. A number of participants indicated that the communication loss caused the Division’s image to be damaged. For example, Participant F related that the entire Division looked silly, which made her look silly. She continued with quotes from her customers and her response. She said, “‘Didn’t you guys go to Web-based application and you don’t have the Internet?’ is what they kept saying, ‘That doesn’t make any sense to us.’ I felt stupid.” Participant M did not meet with any direct comments about the image matter, but reported, “...you could see this in all the meetings” and “...if you want to talk to the Assistant Secretary of the Navy, write [person’s name deleted] at aol.com. I don’t think that did us any good.” Finally, Participant P indicated that

having to share workstations, disturbing the Front Office, and standing around waiting to use a computer “wasn’t a good sign.”

Moreover, the damaged image led to credibility loss and customer disbelief. Participant R indicated, “...how can people think that this office, this Strategic Business Management office can be confident and, beyond confident, can do something really well in the electronic acquisition area, but can’t even keep an e-mail network up?” Participant F found that others did not completely trust that their messages would get to her because she was using an alternative e-mail account.

The communications loss was the source of some strained relationships with persons in other organizations. For example, Participant N reports strains with both Navy command customers “...they would go for weeks and not hear anything from their SBM leadership team. I think that strained the relationship between SBM and its customers a little bit. Not all of them, but...some of them...[who felt] being left out of the process” as well as with the Standard Procurement System Joint Program Office “...meetings were scheduled ...and we never got the note.”

However, Participants I, M, and N indicated that they did not hear any indications that there were negative repercussions from the communications loss.

Further, Participant A found the loss to be beneficial because it “caused...the people...to engage more on a face-to-face basis with the customer...[which is required] in enabling this end-to-end connectivity using these different applications [because it forces] a significant change in culture.”

Effect Number 16 on Increased Time

Effect 16 also speaks for itself because all the captured individual effects clearly illustrate the Effect. It is important to remember that there were no explicit ways of capturing quantitative information about time lost in work accomplishment.

Effect Number 11 on Increased Costs

By addressing things lost, extra work, lost time, and time better allocated to other tasks, Effect 11 captures the idea of added costs. There were no records of any cost expenditures at the level of granularity needed to obtain any insights. However, the lack of specific evidence does not make the conclusion inappropriate. The three most significant events that occurred, which affected costs were the fact that (a) the communication loss caused some computer files to be lost, while others had to be redone; (b) people had to work on restoring communication in lieu of what they were otherwise supposed to be doing; and (c) people had to spend time (and, therefore, funds) on checking to determine what information or messages had arrived on the alternative communication method.

No Effect

Effect Number 28 on No Effect

This element covers Appendix D Effect Number 28 “No effect.” This response came in response to different interview questions, meaning that different persons were affected differently by the various events in the situation. Therefore, “no effect” is a reasonable response for some persons to make to some questions or probes.

For example, Participant A indicated that he had access to the people in the office by alternative communication modes (such as, cell phones) and the others needed to meet his

requirements (e.g., his schedule). Consequently, there was no meaningful effect on him. In contrast, Participant I noted that there was no meaningful effect on his personal work process (in the context of code 3AA) because he continued to do the same job of sharing information as he had done before (after changing e-mail addresses).

Individual Effects Not Placed

Appendix E contains 41 individual effects that the researcher could not align with any particular Effect. They are retained for completeness, for trustworthiness assessments (as noted in Chapter 3), as well as for future researchers' convenience.

Differences Noted by Work Cluster

This breakout was accomplished because the work functions performed by these persons are different and could have an impact on the study's conclusions. Therefore, the researcher generated the table of codes found at Appendix F and reviewed it to see if there were any differences that might lead to or support an Effect.

The codes with significant differences were marked with an "X." The codes were reviewed to determine the basis for differences. After the review, the researcher concluded that these set of differences did not yield any insights useful in establishing or supporting Effects; all ideas had been previously captured.

For example, code 1C, which addressed leadership's failure to provide adequate tools to get work accomplished was not addressed by those in the Front Office Leadership work cluster, but was by everyone else. Given the experiences of the people in this work cluster and the voluntarily nature of the interview, this outcome does not surprise the researcher. In addition, LACKCOMM was discussed above in Effect Number 7 and is noted below. This difference is

simply a function of the way in which information about the communication loss and restoration was provided to the people in the Help Desk work cluster.

Differences Noted by Participants' Gender

The researcher performed a code comparison, similar to that of the work cluster comparison, related to the participants' gender for the same reason as the work cluster comparison. The resulting table is found at Appendix G.

The codes with significant differences were marked with an "X." The codes were reviewed to determine the basis for differences. After the review, the researcher concluded that these set of differences did not yield any insights useful in establishing or supporting Effects; all ideas had been previously captured.

The only two interesting differences between the groups were found in codes LACKCOMM and 5BC. In both cases, the differences are completely unrelated to the participants' gender and are directly related to their work roles. The LACKCOMM difference was noted above in Effect Number 7, which addresses a lack of information. These persons were all female and were never effectively told anything other than to move to a different work location (as noted in Participant G's comment). They all felt some measure of frustration at not knowing the reason, especially since they had to explain to customers why the changes were occurring.

The 5BC difference, which related to performance feedback at the time of the communications restoration, is based on three male participants' interviews. They discuss getting work accomplished from different perspectives, including a notable concentration on metrics. There is no particular reason for females not to have mentioned metrics in their interviews, but

none were captured in the coding. In addition, no participant suggested, during the interviews, that gender was an issue in this situation—the communications loss was disturbing for everyone. Therefore, it is reasonable to conclude that gender played no role in this situation, at least as captured in these interviews.

The Probes' Usefulness

This element discusses the probes' usefulness.

Appendix H relates the code words to the number of coded segments as well as providing a breakdown of the coded segments by interview question and by loss or restoration event.

In general, the probes were useful in obtaining the individual effects found in Appendix E. They provided the participants not only a framework for thinking about the basic issue (e.g. individual results), but also the particular aspects of their individual situations.

There are several things to notice in these Appendices.

1. The probe and code word (3AB and 3AB1) related to the actions taken by the participants to "make do" had the greatest number of coded segments (96). The researcher expected this result because the participants obtained results in spite of the loss of communication.

2. The probe and code word (1A) related to the participants' feelings had the second greatest number of coded segments (69). The researcher expected this result as well; though, he expected the reverse to be true (1A would have more coded segments than 3AB) because of the personal nature of the question.

3. The preponderance of coded segments occurred with respect to the loss event. For example, the most noticeable numbers relate to Question 3; 227 coded segments were captured

in connection with the loss event, while 27 were captured in connection with the restoration. This result (i.e., more comments about the loss than the restoration) was expected.

These differences tell the story that the loss event was more significant to the participants than the restoration event. For example, Participant O said, “[the loss] was crippling. If I had to come down here [the office] every day and not have e-mail, that would have been crippling...I didn’t have e-mail. I would have spent a lot more time on the phone, and it just would have been debilitating.” Similarly, Participant I said, “No matter where I was, either upstairs or down, whatever I wanted was in the other place. So it caused stoppage. Gotta go downstairs. Gotta go upstairs. I think I’ll get it later, and all that. And with my memory, it’s sometimes forgotten.”

In addition, they tell that the people had changed their work locations and their processes. Participant R said, “...I could access that account from here in the office, from my [contractor’s] office, or from home very readily.” Participant M’s whole work process changed because he had to decide on which projects to work without the benefit of his sponsor’s immediate thinking and priorities.

4. Two sets of probes were particularly troublesome for some participants, even though the number of coded segments does not directly show it. The probe in interview question 3 related to creating, sustaining, sharing, or renew knowledge (3AA and 3BA) as well as those of interview question 6 on the three examples of causes of communication disruptions (6A) and on the highly integrated systems (6B) were hard for some persons to address.

The interview question 3 probes (3AB and 3BA) originate in the study’s definition of knowledge work. The researcher’s impression, during the interview process, was that some participants had a difficult time trying to understand the way in which the terms fit together, but

could give examples of things they did to perform the work. In other words, they gave examples of sharing information, but did not really understand what they might have done to sustain or renew knowledge. This outcome may be the result of any number of things. For example, it may evolve from the way in which the participants think about knowledge work, that they do not think of themselves as doing knowledge work, that the concept of knowledge work may be somewhat foreign to them, and/or any number of other reasons that might be pursued at another time.

Turning to interview question 6, the researcher's impression is that the question generally was outside the way in which the participants normally thought. However, after an initial conversation about the question, several noted the need for business continuity plans (Effect 20). The probes themselves could have been reworded to capture the first three as illustrations of causes of communication disruptions, while the fourth could have been couched more clearly in terms of the ERP, with which the Navy has some experience.

Important Items That Were Not Very Visible

The researcher was surprised that the following items were not more visible in the data. This lack of visibility could be based on a number of things, such as the interview questions, the coding process, or the nature of the items themselves.

Internet-Based Communication

The study's definition of Internet-based communication covers e-mail as well as Internet search and file transfer capabilities. Perhaps the study's most striking items were the lack of discussion about the Internet capabilities and the preponderance of discussion about e-mail as a critical performance tool. The preponderance of SBM Division work cluster interviews covered

e-mail and its ability as a tool to get work accomplished. Persons in other work clusters, such as the Front Office, while also concerned about e-mail, addressed a number of other issues as well.

This disparity struck the researcher as intriguing. Considering this idea from his complete participant point of view, it became clear to him that the people in the SBM Division work cluster were (and are) extremely dependent upon e-mail for accomplishing their work on a day-to-day basis. For example, at the outset of his interview, Participant M said, "I live and die on...my ability to be available to a large number of people...[some of whom] send rapid e-mails." Alternatively, their need to access Web sites and to transfer files to Web sites' libraries is not as frequent as handling their e-mail and addressing the requirements expressed therein.

Trust

There were approximately 6 coded segments from 4 participants related to the idea that "familiarity breeds trust," in Participant R's words. There were 3 mentions of this idea by 3 of the 4 people in the context of a person's physical availability to respond to immediate requirements as well as to engage in conversations, which would allow the participant to see physical body language.

The researcher was initially surprised by the lack of discussion about trust. He was not quite as surprised, when he considered the situation from this complete participant role. The majority of the people remained associated with the Division, even though their physical work location may have been different. Therefore, there were continuing interpersonal connections in the physical workplace, by telephone, or other means. More importantly, their work-related interpersonal relationships did not change. The people did not have to learn or to relearn to trust one another because only their ability to communicate with one another was disrupted.

Change Management

There is a great body of literature on change management available. For example, Kotter (1996) outlines an eight-stage process for implementing change within organizations. Some of the stages are “establishing a sense of urgency,” “communicating the change vision,” “empowering the employees for broad-based action,” and “anchoring new approaches in the culture.”

This communication loss and restoration situation is an excellent example of a poorly implemented change management program. No participant indicated that there was a change management initiative undertaken to maximize the benefit or, at least, minimize the damage from the disruption. As noted in Effect 7. “Some persons were not told how the loss occurred and, more importantly, what to tell their customers,” one of the prime aspects of a change management program, communication with the affected parties, was not accomplished. Another key aspect, empowering employees, was implemented, but not seen as such. The employees were empowered—that is, left on their own to accomplish their work (Effect 2. “Everyone moved” and Effect 3 “Management did not fulfill its responsibility to provide tools to accomplish the work”).

Summary

This chapter presents the individual effects data as categorized into Effects. The Effects and the related individual effects data are connected to the theoretical framework. The chapter also provides information related to the researcher’s work to view the data from work cluster and gender perspectives. Finally, it discusses some items that were not discussed or, at least, broadly discussed by the participants.

CHAPTER 5. CONCLUSIONS, RECOMMENDATIONS, AND SUMMARY

This Chapter provides the researcher's conclusions, his recommendations for future work, and his summary of the study.

Conclusions

The researcher drew a number of conclusions from this study. The first, concerning the set of effects found in Appendix B, is a direct outcome of the study itself. The second one that addresses the organization's success is based in on the set of effects and shows their relationship to one another and to the theoretical framework. The third conclusion puts the study, the Effects, the success conclusion, the communication loss and restoration, the Division's work into the context of this Division being organized as a network from its inception and performing its mission in that fashion. Finally, there is a series of other conclusions that are focused on particular aspects of the study.

The Set of Effects

The researcher's first conclusion is that the study was successful in obtaining the descriptive set of effects caused by the communications loss and restoration. The set of 23 Effects is found in Appendix B.

The Organization's Success

The researcher's second conclusion is that the people in SBM were successful in accomplishing their work because they became a group that accomplished its work through the Department of the Navy acquisition and contracting network on a multiple node basis.

The following discussion demonstrates how this conclusion summarizes all the Effects and illustrates their interrelationship. The discussion uses as the theoretical framework as a baseline.

This conclusion is twofold. First, the people in the Division succeeded in its endeavors despite this communications loss. Second, the most significant thing that occurred in the Division was the paradigm shift from being a virtual organization that is a *single physical site work location* (single node) connected by the Internet to a network of commands and people around the world to being a virtual organization that is a *multiple physical site work location* (multiple node) connected by the Internet to a network of commands and people around the world.

The First Portion

The people in the Division succeeded in their endeavors in spite of this communications loss. The reasons they succeeded are discussed below. It is necessary to mention that the researcher believes that their success was not guaranteed and was based substantially and primarily on their determination to succeed. They simply concluded, "Not getting work accomplished (failure) was not an option."

In this light, the determination demonstrated in this case is representative of the Department of the Navy culture. One of the ideas that is typically included in awards given to Department of the Navy military and civilian employees is "...in the finest traditions of Naval service." (Of course, there would be no award if the service were not exemplary). Nonetheless, given the participants' backgrounds (noted earlier) as long-term Navy employees and as current

or former leaders, this determination and success (while never guaranteed) might reasonably be assumed.

Considering their determination and success and following the theoretical framework, the researcher reached these supporting conclusions.

1. The Division's customers did not change (as noted in Appendix D Effect Number 14 and the researcher's role as complete participant).

2. The Division's purpose and goals did not change (as noted by the discussions on Purpose and Goals as well as the researcher's observations in his complete participant role).

3. The critical results (system operation and support to the Navy commands) continued at the same quality level, during the time of the communications loss and at the communications restoration (Effect Numbers 17 and 25). There were some negative time and cost results (i.e., some things took longer or diverted assets [with negative cost impacts] than they had previously or would have been expected) as noted in Effect Numbers 11, 16, and 18).

4. The technology change was the Division's communications loss and restoration. This change led to people using alternative communication methods (such as, alternate e-mail accounts and cell phones), as noted in Effect Number 12. Further, this change raised the consciousness of all participants on the need for an intentional business continuity plan (Effect Number 20).

5. Some processes remained constant, while others changed. Each person experienced the communications loss and restoration individually and as an individual knowledge worker. In one person's case a process—uploading documents to a file server—may have changed, while in others' a process—for example, the contracting process—may not have changed.

As noted in Chapter 4, Effect Number 17, “Key aspects of the office’s functioning continued unabated.” indicates that the key processes (e.g., software development and maintenance, budget, and contracting) continued without disruption. Effect Numbers 9, “Some people became a communications centers.” 10, “The people made and implemented new communications plans.” and 26, “The people created new processes” show very clearly that there was process change.

6. The individual persons did not change. The communication loss and restoration events were changes that brought a series of emotions with them, including frustration (Effect Number 1). Moreover, the events did require the people to think about themselves as individuals in this situation as well as their role in the office (Effect Number 24). There was a difference of view about the importance of physically being in the office; however, it is reasonable to conclude that face-to-face interactions are important for office functioning and cohesiveness (Effect Numbers 6 and 8).

The Second Portion

The second portion is that this Division became a group of persons that can get the work accomplished from a number of places, not just one. These communication loss and restoration events caused a paradigm shift from being a virtual organization that is a *single physical site work location* connected by the Internet to a network of commands and people around the world to being a virtual organization that is a *multiple physical site work location* connected by the Internet to a network of commands and people around the world.

This conclusion is supported by fact that the people kept focused on their customers (Effect Number 14) and on their responsibilities (Effect Number 17), even though they all moved

to some alternative location (Effect Number 2) and used different communication modes (Effect Number 12).

Support from the Failure Literature

Ultimately, this entire situation is the result of the communications loss, which can be understood as a failure to have the appropriate tools in place to accomplish work. From the outset, it was clear that not accomplishing work (failure) was not an option.

Ignoring the (previously addressed) issue of responsibility for the loss, the failure literature highlights a set of strategies for accommodating failures. The following discussion shows the ways in which the SBM Division people's actions connect to that strategy set.

1. They remove the exception through improvisation...try alternative solutions. In this case, they moved (Number 2) to places where they could have Internet-based communication and they used alternative communication methods (Appendix D Effect Number 12).

2. They remove root causes. As above, they moved and used alternative methods.

3. They adapt to failure. By communicating differently (Appendix D Effect Numbers 9 and 10), they kept communication flowing despite the loss.

4. They downplay errors and failures. This behavior explains the lack of communication experienced by some of the participants (Appendix D Effect Number 7).

5. They engage in "heroic" actions. Because the group was successful, they all were heroes. However, there was some "heroism" demonstrated in the way in which some persons became communication centers (Appendix D Effect Number 9). Specifically, in addition to their normal consultant responsibilities, they literally printed documents and hand-carried them to persons without Internet connection as well as literally resending e-mails to and from these same

persons. Finally, as noted earlier, several participants used verbal and body language during their interviews that indicated to the researcher that they understood their actions to be, if not as heroic certainly, as “in control.”

6. They learn from others. There was no evidence of the people learning from others or telling others about the situation as a “lesson learned.” However, this situation is (hopefully) so rare and never repeated that a lack of evidence is an extremely good thing.

Recapitulation

This conclusion is reasonable because it is supported directly from the data itself; it connects with a critical aspect of the literature review; and, it is consistent with the propositions.

The Division as a Network

This third conclusion is that this success is based, in significant measure, on the Division being structured—from its inception—as a network. With this conclusion, the researcher does not intentionally or unintentionally want to offend, hurt, or harm any individual or group. The participants performed magnificently in their accomplishing their work and supporting the Department of the Navy. The researcher is happy to have been associated with these people and, as their peer and their leader, extremely happy with their work products. However, while the change from a single node to a multiple node structure as noted above (and in some of the conclusions that follow) was significant, this change was not as dramatic and challenging as it could have been.

As noted earlier, the Division began operations in January 1998. As Participants K and R noted, it was designed to be flexible. More importantly, though, it was designed as a network in which the leadership (including a small program office) would be located in the Secretariat and

the DON Systems Commands (e.g., Naval Sea Systems Command or Naval Air Systems Command) would make the bulk of the contributions. This structure was used because it was the most effective way of accomplishing the work within the given budget and personnel constraints. Its significant advantage is its ability to meet compelling deadlines of Year 2000 and paperless process (noted earlier), provide leadership to the Commands, and leverage the Command requirements and assets.

This network structure enabled the Division to achieve its objectives and to produce the products discussed in Chapter 1. Furthermore, it established a pattern of work-related interpersonal relationships and processes that served the DON well. Therefore, when the communications loss occurred, this organizational approach was so well ingrained as a process that the shift to multiple work locations from a single work location did not draw as much attention as it might have drawn.

In short, the participants and the other persons associated with the Division experienced a lack of bureaucracy because they were working in a network. Just as the success discussed in the second conclusion was not guaranteed, success with this network was not guaranteed. The researcher (from his privileged position) saw that constancy of purpose, leadership, attention to customer (i.e., Command) needs, and effective use of resources were needed to lead to success.

Arquilla and Ronfeldt (2001) provide a series of propositions about networks in war situations. While these propositions are directly related to warfare, they provide useful insights to support this conclusion. For example,

1. *"Hierarchies have a difficult time fighting networks"* [emphasis in original]. "...social netwar can put a democratizing autocracy on the defensive and pressure it to continue adopting

reforms” (p. 15). In this situation, the direct focus of and constant pressure from the Division to adopt new ways of doing business (i.e., using the Division’s systems) in conjunction with the underlying imperatives and Secretariat’s leadership caused the Systems Command (bureaucracies in their own right, but not “democratizing autocracies”) to change.

2. *“It takes networks to fight networks”* [emphasis in original]. This idea means that persons will need to draw on the design principles, which depend on technological innovation, willingness to innovate organizationally and doctrinally, and perhaps building new mechanisms for interagency and multijurisdictional cooperation (p. 15). In the Division’s case, there was no attempt to fight another network. There was, however, a compelling need and a success at innovation and new mechanisms for interagency (including within DON) cooperation. Some of the participants were engaged in this type activity, but did not mention it because these actions were outside the scope of the questions (at least, as they responded to them).

3. *“Whoever masters the network form first and best will gain major advantages”* [emphasis in original] (p. 15). The authors’ examples are not directly appropriate to this situation. However, it seems to the researcher that both Amazon.com and ebay.com offer excellent illustrations. In this case, it is clear that the network form was fundamental to the Division’s success either before or after the communications loss.

4. *“Counter netwar may thus require very effective interagency approaches, which by their nature involve network structures...the challenge will be to blend these two forms [bureaucracy and network] skillfully”* (p. 16). The Division’s location in the Secretariat places it in a bureaucracy and its network form to work accomplishment demonstrates this skillful blending.

Arquilla and Ronfeldt (2001) indicate that there is no standard methodology for analyzing organizational network forms. However, they say that network design and performance are dependent on actions across the organizational (i.e., its organizational design), narrative (i.e., the story being told), doctrinal (i.e., the collaborative strategies and methods), technological (i.e., the information systems), and social (i.e., the personal ties that assure loyalty and trust) levels of analysis (pp. 323–324). While analysis across these levels is beyond the scope of this study, the researcher sees and hopes the reader sees examples of each of these levels in the study's data and analysis.

Networks and the Division

The Division was created and operated as a network, as noted above. It operated as a network during the time of the communications loss and continues in this pattern to the present time. Some of the conclusions noted above demonstrate that the Division was successful. Arquilla and Ronfeldt's (2001) five levels of organizational analysis provide another method for examining this case.

Analysis by Level

The organizational level addresses the extent to which the group is organized as a network as well as its form (e.g., chain, star, or all channel). This level concerns itself with issues such as decision-making process, amount of centralization, and communication (Arquilla and Ronfeldt, 2001, p. 325 – 326).

In this case, the Division was created as an all channel network and was extremely dependent on its Internet-based communication. This communication allowed activities located worldwide to participate in the Division's programs and decisions without intervening levels of

authority (in other words, there was a minimum [if any] bureaucracy). They made physical changes and e-mail account changes to continue their progress. The changes themselves were not particularly significant, although the implications, for certain people, were quite significant.

The narrative level relates to the stories people tell one another about their identity (i.e., who “we” are, why we came together, and why we are different) as well as about their sense of cause, purpose, and mission. In addition, these stories also allow groups to create bridges across different networks (Arquilla and Ronfeldt, 2001, p. 328).

The Division told and enacted its story well. Its purpose was paperless acquisition. Its people thought of it as the “high tech office” and the “paperless office”: moreover, it allowed and encouraged others to think of it in these same terms. It was and behaved as an independent entity. Therefore, when the leadership and organizational changes occurred and there was no appropriately focused change management initiative, the people responded appropriately to a situation in which there is change without a vision of the future. Therein lies some of the reason for the emotions they experienced and expressed, such as Participant J’s comment that the Division became “profoundly different.” Their reality and their narrative changed from their being independent to being part of a bureaucracy.

The doctrinal level “explains what enables the members to operate strategically and tactically, without necessarily having to resort to a central command or leader. It describes the group’s shared principles and practices to which members “subscribe in a deep way.” It can provide a central ideational, strategic, and operational coherence that allows tactical decentralization (Arquilla and Ronfeldt, 2001, p. 333).

The people in the Division did not change any aspect of their situation that would be described by this level of analysis. They continued to believe in the office, its work, and its value.

The technological level of analysis is concerned with the "pattern of, and capacity for, information and communications flows within an organizational network" (Arquilla and Ronfeldt, 2001, p. 339). In this case, the persons moved their physical location to obtain uninterrupted communications service. This change caused them to make minor adjustments, such as changing e-mail addresses (as noted above, there were other, more serious implications). However, fundamentally, the changes needed for reconnection to the network were quite small. Therefore, the researcher concluded that, once reconnected, there was no change at this level.

The social level is the one related to "how well, and in what ways, the members are personally known and connected to each other." Analysis at this level would focus on strong personal ties, friendship, trust, and loyalty (Arquilla & Ronfeldt, 2001, p. 341).

The people associated with the Division were known and connected to one another. This connection, of course, depended upon each particular person's situation. Any individual would know some people better than others, but, generally, the group was small enough that they knew each other reasonably well. The loss and restoration events did not really have a significant impact on the people or their relationships.

Other Conclusions Related to the Study

This portion addresses the researcher's other conclusions, which are related to the study and its methodology.

Conclusions from the Study

The researcher came to a number of conclusions from the study. He reached them based on his privileged complete participant point of view and the intensity of the participants' emotions. Many of these conclusions cannot be overwhelmingly supported by the data; indeed, as indicated in Chapter 4, there is both confirming and contradicting evidence. Nevertheless, he feels comfortable with these conclusions, which are listed somewhat in order of importance.

Paradigm shift. The researcher concluded that a paradigm shift occurred as noted above. However, since paradigm shifts are changes in the ways people think about themselves and their worlds (Kuhn, 1970), not every participant understood these events as such.

As noted in the Member Checking portion of Chapter 3, the focus group clearly believed that the people went through a paradigm shift. This conclusion is based on the fact that they accomplished their work effectively without being only in one place.

An interesting aspect of this element is that, in the researcher's view, the participants did not necessarily see the paradigm shift articulated by the focus group. It could be argued that the communications loss disturbed the trust and belief in the leadership (of some persons) significantly enough that the participants retreated not only physically to other locations (Appendix D Effect Number 2) but also more importantly—mentally—to focusing on accomplishing those tasks that were asked of them. In this light, Participant O's ideas are repeated. He said, "a lot of people lost credibility in my eyes", "it [the loss situation]... just kind of changed my attitude", and "it [the loss situation] ... left a bad taste in my mouth." He concludes that "Technology is not the issue, but it's more personality, and leadership, and things like that."

Identity. The researcher concluded that the change in network service provider, in connection with the simultaneous organizational changes, did change the Division's identity.

Appendix D Effect Number 24, "The question of 'Who are we?' became important," captures the idea that the SBM Division changed in its self-understanding. This idea seems to be related to the paradigm change notion addressed above.

The discussion of this Effect in Chapter 4 includes a short history of the SBM Division as well as some very dramatic wording about some persons' feeling a part of SBM but not feeling part of ABM. Reviewing the individual effects found in Appendix E, it is clear that only a few individuals made reports and there was a difference in the ways the participants understood the change.

As noted in the Member Checking portion of Chapter 3, Participant J indicated that, as the SBM Division became more integrated into ABM by receiving service from and having e-mail accounts on its network, SBM underwent a "profound" change from being a separate, stand alone function to being part of the larger organization.

Diamond (1993) defines organizational identity to be "the unconscious foundation for organizational culture" (p. 77). Moreover, he suggests, "Organizational identity represents the means by which work groups orient themselves toward the organization and from which individuals acquire their own sense of security and identity as members" (p. 78).

In this light, it is not surprising that there were so few reports — people did not think about it. Further, the change required by "becoming ABM" and using "the ABM network" would force a reorientation of the individuals' thinking about the two offices — using the ABM network would mean a complete loss of SBM's independence.

Change Management. For the reasons noted in Chapter 4, the researcher concluded that the communications loss and restoration events were change management initiatives that could have been handled more effectively.

The chosen approach—“do what you need to do to get your work accomplished”—was effective in this case. However, the researcher believes it was effective for reasons already noted, such as the participants’ determination to succeed and ready availability of acceptable alternatives and not because it was the most effective one that could have been selected. The most significant negative aspects of this approach were the loss of community within the group and the inability to obtain group solutions that minimized the damage incurred by the situation. For example, he believes that the type of animosity felt by Participant O (“left a bad taste in my mouth”) could have been minimized and that the organizational engagement Participant O had before the communications loss might have been maintained instead of being needlessly dissipated.

Management’s role. The researcher concluded that management made a series of judgments that effectively empowered the people to do whatever was necessary to get the work accomplished and, simultaneously, a series that interfered with work accomplishment. In other words, it would have been better for management to intervene earlier than it did in the restoration process.

Appendix D Effect Number 3 “Management did not fulfill its responsibility to provide tools to accomplish the work” is not directly focused on the people in the Front Office. It is focused on all the individuals who played a role in providing service to the knowledge workers, whose focus was on work accomplishment. These individuals would be found in the Front

Office, but also in the network service group and the budget group. The participants drew no particular distinctions among these other groups—they simply wanted to get their work accomplished.

The situation was that the Front Office management played a dual role—one person thought that the communications restoration process was begun and would soon be finished; the other person—to whom the task was assigned—did not become engaged in the situation as early as possible. In any event, Front Office management did not become effectively engaged because the people in the Division kept producing results.

Therein lies a management puzzle: achieving the proper balance of empowerment and engagement. On one hand, the manager must empower people (and, especially, knowledge workers) to get their jobs done as best they can. On the other hand, the manager must know when and at what level to become engaged, without being controlling. In this case, each one of the two people in the Front Office represented one of these positions.

Abrashoff (2002) relates his experiences (and the lessons he drew from them) as a U.S. Navy destroyer Commanding Officer. His assessment for doing the right thing is that "...feels right, smells right, tastes right, it's almost surely the right thing—and you will be on the right track" (p. 9). The researcher does not intend to offend or indicate that these persons did not do the right thing. In light of Abrashoff's idea as well as the fact that the affected persons were knowledge workers, they were most certainly managing effectively. However, there comes a time at which management must intercede to improve the situation or the process.

Instant Messaging. The researcher concluded that the instant messaging capability used by the persons in the Help Desk work cluster is critical to their success. Further, he concluded

that having this capability expanded would be beneficial to the entire Navy. He also knows that the Navy's need for security and its contract for network service preclude implementation of this capability.

From his privileged point of view, the researcher believes that the people in this work cluster use (or used it when it was available) this capability because (a) it was effective in accomplishing work and (b) they had a good deal of experience with it from prior situations. Participant F's dramatic descriptions of her feelings of loss ("a blow to my gut") when she could no longer use the capability are indicative of the value she placed in its effectiveness.

Methodology

In general, the methodology accomplished its objectives because it generated the set of Effects that was required. There are some additional ideas, noted below, for others to consider.

The study's evaluation criteria. As noted in Chapter 3, a set of evaluation criteria was proposed to demonstrate the study's success. The following discussion addresses each of the criteria.

The researchers' conclusions are supported by the data and show ideas for future work. The conclusions are provided above and ideas follow.

The completed tables led to themes that provide insights and ideas for future work. Appendices B and D show the Effects (themes), which evolved from this work. Appendix E provides all the individual effects. These listings can help others to consider their own situations and ideas they might want to investigate.

The researcher found the probes to be useful in general. For future work, the probes in Interview Question 3 (the first ones in both parts of Question 3) related to sharing knowledge

could be more closely aligned with the work the people actually do and the language they use on a day-to-day basis. The researcher's general impression is that these probes put the participants in a difficult position because they routinely do not think in the terms of the probes' wording—they perform the functions, they just name the function something else. The probes, associated with Interview Question 6, could have been reworded to more appropriately address the issues of "in what ways do I get my work accomplished when I lose communications" and "in what ways would my integrated system, such as an Enterprise Resource Planning system, operate if communication were lost."

There was very little documented in this case for the reasons outlined earlier. That limited information, which was available, confirmed the participants' ideas. Therefore, the documentation was used as support for Effects and not necessarily for future work.

Interview Protocol. As noted in the Chapter 3 discussion of the interview protocol and on the Informed Consent Form in Appendix A, one participant added the idea found in the penultimate paragraph of his Informed Consent Form. This addition was reworded slightly and added to the Form included in Appendix A because the idea is excellent and an important limitation on the use of the participants' information.

Recommendations for Future Research

This section covers the researcher's recommendations for future research. It contains a prime recommendation, other organization and management based recommendations, and methodological recommendations.

The Researcher's Prime Recommendation

The researcher recommends that no organization or person ever undertake, for any reason or for any length of time, repetition of the communication loss addressed in this study. While a number of good things evolved from it, the experience is, generally, best treated as a source of lessons learned for other people.

Other Organization and Management Based Recommendations

The following set of recommendations suggests some ideas that would contribute to understanding more about people in virtual organizations.

Network

Future research into a physical or virtual organization's use of organizational networks is critical because of the extent to which they are being used. For example, the United States is waging a war on terror, which is partially focused on the disruption of terrorist networks. Businesses are using alliances and partnerships to obtain goods and services they need; business-to-business marketplaces (sometimes called trading exchanges, as in the case of Exostar) are used routinely for buying and selling. The United States Federal Government is using its FirstGov Web site for a number of purposes. Collaborative work and learning is being accomplished through various software products (such as Lotus Notes).

Further organizational research on virtual organizations, focused on any or all of Arquilla and Ronfeldt's (2001) five levels of analysis, would be extremely valuable. For example, as noted in Chapter 4, the absence of discussion by the participants about trust (which is, certainly, in the social level of analysis) would be an intriguing study. In addition, it would be interesting to take the same interviews and recode them in line with the five levels in order to determine if any

additional insights would be generated. However, the researcher would not undertake such an activity because he believes that it would violate the Informed Consent granted by the participants in general and Participant A's in particular.

Paradigm Shift

The researcher suggests that this difference in points of view noted above (a paradigm shift occurred versus it did not occur) highlights the opportunity for further research in the area of persons' understanding of their virtual organizations before, during, and after change.

Determination to Succeed

The researcher concluded that the group's success in spite of the communications loss was the result of the individuals' determination to succeed. He believes that these persons were experienced in the Navy culture and "just knew" what they had to do. For example, Participant L noted, "we had gotten used to working around it." Participant J indicated that he was surprised by the communications loss, but very quickly found an alternative access to continue his Internet-based communication. Generally, the people adapted to the new situation without much fanfare.

The researcher recommends that work in the areas of decision antecedents, organizational culture, and success and failure, which is focused on virtual organizations, be considered for the future.

Identity

There were few reports concerning identity because people did not think about it. Further, the change required by "becoming ABM" and using "the ABM network" forced a reorientation

of the individuals' thinking about the two offices—using the ABM network would mean a complete loss of SBM's independence.

The researcher has no interest in delving into the individual and group psychology of these events or in their further examination. He would suggest that changes in an organizational network—whether physical or virtual—would affect the ways in which people understand themselves and their relationships. The researcher believes that there is a significant opportunity in researching the identity dynamics of networks.

Office as a System

Further research into the idea of a virtual organization as a system is suggested, based on Appendix D Effect Number 18. "The office, as a system, was debated."

There are only a few individual effects from a few participants noted in Appendix E. The researcher believes that this paucity of ideas is based on the fact that these participants do not think about this concept routinely. Therefore, they did not have any organized thoughts to share. However, those that were shared are quite divergent.

Therefore, the researcher suggests that research in this area could be beneficial because organizations, virtual or not, are systems. It would be useful to have additional information about the ways in which such systems operate.

Office's Ability to Produce Results

Appendix D Effect Number 19. "The office's ability to deliver results was debated," as found in Appendix E contains a series of conflicting views around two key ideas—customer relationships and image (or brand). Several individual effects indicate that some customer relationships were strained while others were not; credibility was lost for some customers and

not for others. In addition, the office's image did not gain any luster by losing its communication.

The researcher believes that these diverse views are the result of the office having a set of diverse customers requiring different things in addition to the participants having differing experiences. Further examination of a virtual organization's customers, the ways in which they understand the organization, and the ways in which they use the organization to meet their needs are reasonable matters to be considered in the future.

Management's Role

As noted above, the management puzzle is achieving the proper balance of empowerment and engagement.

The researcher was surprised by the fact that so much time passed (approximately 4 months) before management intervened to correct the situation. Therefore, recognizing that this situation involved a series of management judgment calls (as every other situation does), he suggests that work be considered to determine if there is anything about the virtual organization, which might change or determine an appropriate timing for intervention. Certainly, it is easy to act too soon, with the result of over-control and destruction of initiative; however, it is also possible to delay too long and frustrate people who are trying to accomplish work.

Methodological Recommendations

The research makes the following two recommendations.

Measuring Frustration, Grief, and Stress

Appendix D Effect Number 1. "The people experienced a range of emotions," shows that the individuals' experienced many emotions. For example, there was frustration, surprise, and a lack of surprise.

Some of the participants, at the time of the interviews, showed emotions that seemed to be rooted in their responses to the events being studied. The researcher was surprised that these emotions remained reasonably strongly held even though the loss event occurred about 1 year earlier than the interview and the restoration about 6 months earlier. This emotion level certainly seemed to be based on the concern these people felt about getting their work accomplished; their interest in doing their best for the Navy all the time; and the frustration they felt by not having appropriate tools to get the work accomplished. For example, as reported earlier, Participant O found that this failure to maintain communications colored his entire view of the office and its ability to produce results.

It seems that some method for measuring frustration, grief, or stress might have been helpful in gaining insights in this case. Such a method may exist; since this dissertation is in the organization and management field, the researcher is unaware of one. Assuming such a method existed, it is not clear to the researcher that its use would have added any value to the study.

Measuring "Virtualness"

One of this study's limitations was that it did not attempt to measure "virtualness." The researcher is not clear on how to define "virtualness" on ways by which to measure it, or on the value of such a definition and measurement device. He is clear, though, that some description or set of descriptors might have led to a clearer definition, at the study's outset, of the office as a

single node in its network; what its business continuity plans were or could have been; and whether it had options that were otherwise available, but not identified.

Accordingly, he suggests that some work in this area of inquiry might be useful.

Summary

This study obtained a set of effects resulting from an office's loss and restoration of its Internet-based communication. The people in the office were successful in continuing to complete their work for a number of reasons.

The first reason is that their network was resilient enough to allow them to continue because it had non-disrupted links and was not dependent upon working from one and only one place.

The second and, as the researcher concludes, more important reason is that they never gave up – their “hearts and minds” never changed. They were committed to organizational success. To them, “failure was not an option.” They simply were going to succeed because that is what Navy people do. On a much larger scale, they are committed to the Navy's success.

The researcher is proud to have been associated with these people and prays that the United States of America will always be able to obtain the professional skills of persons who are as dedicated as this group of people are.

When the researcher retired from the federal service, he left the other people with the following statement made by President John F. Kennedy in August 1963.

“Any man who may be asked in this century what he did to make his life worthwhile, I think can respond with a good deal of pride and satisfaction, ‘I served in the United States Navy.’”

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APPENDIX A. INTERVIEW PROTOCOL

This Appendix contains six elements, which outline, generally, the way in which the interviews were conducted.

The first section provides the detailed interview process used in this study. It is noted that this process is ideal and was not implemented in this fashion in every case. For example, the researcher was able to speak with some persons in the office, when he was there to interview others. Therefore, written confirmation was not always made. However, no key aspect of the process was omitted and the entire process, including the theoretical framework and the questions were explained and all Participant questions were answered before the interview was begun. In addition, both the Participant and the Researcher signed the Informed Consent Form before the interview and recording began.

The second section provides a sample invitation letter used and which were modified to accommodate the specific situation for each interview. For example, a telephone interview in lieu of a face-to-face interview may be used and needs to be addressed.

The third section provides the Participant Business Information sheet used to collect limited personal identification information. Its primary purposes are to ensure that the participant's time associated with the Division is appropriate for the study and to be able to contact the participant in the future, if needed.

This section provides the required Informed Consent Form, created for use in this study. For future work, the penultimate paragraph was added to capture the idea provided by one of the Participants. He insisted that his interview was given strictly for this study, that no information could be used outside of the study and the dissertation, and that written assurance be provided to this effect. Accordingly, he made a handwritten annotation to this effect on his Informed Consent Form. The penultimate paragraph is a more complete thought than the annotation.

This fifth section provides the questions with probes to be used by the researcher to keep the interview focused on matters of concern to the study.

The sixth and final section provides the rationale for each interview question and the related probes as well as the portion of the Literature Review to which the probe relates.

Interview Process

1. Initial Contact

- a. Contact potential participant to determine if he or she is interested and available
- b. Relate the dissertation's purpose and indicate why the participant's experiences are needed.
- c. Tell potential participant about how he or she will be protected in this study.
- d. Suggest the need for documentation and providing it to the researcher before the meeting.
- e. Obtain business information for future reference and contact before the meeting.
- f. Establish a time, date, and place or phone number for meeting.
- g. Leave researcher's name, email address, work and home phone numbers with participant.
- h. Confirm appointment in writing.

2. Pre-Meeting Effort

- a. Send a Thank You note with copies of the interview questions (without the probes) and the Informed Consent Form.
- b. Create a person-specific folder with interview questions (including probes) and paper.
- c. Test audio recorder and ensure that a sufficient number of tapes are available.
- d. About one day ahead of time, call to confirm the appointment and remind the participant of need for documentation.

3. Meeting

- a. Arrive early at the site.
- b. Thank participant for his or her time, sharing his or her ideas, and trusting the researcher.
- c. Validate the business information with the participant.
- d. Retell the dissertation purpose and objectives.
- e. Ensure that the participant understands the voluntary basis of his or her participation.
- f. Introduce the Informed Consent Form and obtain the participant's and researcher's signatures.
- g. Provide copies of names and phone numbers for researcher, mentor, and Capella University representative.
- h. Tell the individual about the rationale for audio recording.
- i. Determine if the participant objects to audio recording.
- j. If the participant will allow audio recording, place the recorder within easy reach of the participant. Tell the participant that he or she is in control of the audio recorder's running.
- k. Monitor the audio recording so that nothing is lost.
- l. Proceed through interview questions, covering all probes. Gather personal documentation, as the participant provides it.
- m. End interview with a smile and thank you.
- n. Leave quickly.

4. Post-Meeting

- a. **Send Thank You note immediately to participant.**
- b. **Review the recording and any notes to ensure clarity of ideas.**
- c. **If any problems are discovered, follow up immediately with the participant to ensure that clarity is obtained.**

Interview Invitation Letter

Mr. or Ms.
Street
City, State ZIP

Dear Mr. or Ms.

I would like to invite you to participate in a personal interview on _____ at _____ in _____ . This letter confirms our conversation of _____ .

As I indicated in our conversation, I am a Doctoral Learner at Capella University in Minneapolis, Minnesota. My degree will be in Organization and Management with Specializations in Leadership and E-Business.

My dissertation topic relates the impacts of workplace Internet-based communications on individuals' and organizations' work processes and results. This topic is important and relevant to the Strategic Business Management Division because, as you know, this Division lost and restored its Internet and email communications and will soon be moving into the Pentagon. This case study and the responses to this loss and restoration provide an excellent source of information and learning.

I am inviting you to participate in an audio-recorded interview, lasting approximately one hour. The questions I plan on asking are attached for your reflection before the interview itself. Your participation is completely voluntary. I will not reveal, under any circumstances, your participation or lack of participation; in addition, I will not reveal nor directly attribute to you any comment that you make during the session. While I am planning on a one-hour interview, it is perfectly acceptable to finish before the allotted time or to extend the time, if you need the time to express your ideas completely.

It would be helpful for you to review your cell phone bills, personal or corporate email accounts, or similar usage records to refresh your memory on these events. It would also be helpful if you would agree to share those records with me. The records could be disguised by you or will be disguised by me to eliminate your name and other personal identifying information. Your sharing or not sharing these records in no way affects your participation in the interview.

Thank you for participating and helping me in my pursuits.

Sincerely,

Edward A. Callaway

Enclosure

Participant Business Information

Name(s) and Rank(s) _____

Title(s) _____

Date _____ Time _____

Place _____

Contact Information

Work Address _____

Email Address _____

Work Phone Number _____

Key SBM Responsibilities:

How long has the interviewed person been with SBM or ABM? _____

How long has the interviewed person been in the current position? _____

Did the individual have any prior positions in SBM or ABM? _____

Time in SBM: Start Date _____ End Date _____

Sex _____ Age (by age range, e.g., 20's, 30's) _____

CAPELLA UNIVERSITY
222 South 9th Street, 20th Floor
Minneapolis, Minnesota 55402

Informed Consent Form

Title of Study: The Effects of Workplace Internet-Based Communication Changes On A United States Navy Office: A Case Study

Mentor: Dr. Norman Pearson

Researcher: Edward A. Callaway

In an effort to investigate the changes that resulted from the loss and restoration of Internet-based communications the Division experienced while you were part of the group, I would like to ask for your participation in a research project for my doctoral dissertation. The research consists of in-depth interviews with persons who are or were in the Strategic Business Management Division and in the Acquisition and Business Management front office. The questions are intended to generate discussion about your experiences, actions, and ideas.

The information will be audio recorded to make the interview experience meaningful for both of us, to capture your ideas accurately, as well as for my convenience. The recordings will be held securely under my control until final University approval of my dissertation. At that time, the recordings will be destroyed, probably by demagnetization. Prior to their destruction, only I have access to them. Your answering follow-up questions for clarification may be needed.

There are no foreseeable risks or discomforts to you. There are no costs to you.

Your participation is voluntary. You may withdraw from the study at any time and for any reason, without explaining your rationale. In addition, you may decline to answer any question posed during the interview, without explaining your rationale. The researcher will not report to anyone about your participation or non-participation. The personal benefits for participation include personal growth by reflecting on your experiences privately and with the researcher.

All data collected in this study will be confidential; all person-identifiable data will be coded so that you cannot be identified.

This study is being conducted by Mr. Edward A. Callaway, a Doctoral candidate at Capella University. He may be reached at home on 703-491-4376 for questions or complaints. Mr. Callaway's Mentor is Dr. Norman Pearson, who may be reached on 519-782-3698. You may also contact Capella University's Business School Dean at 800-987-2282 x 5326, if you have any questions or comments regarding your rights as a participant in this study.

This interview is to be used only for the purposes of this doctoral study.

Our signatures below indicate that we both understand your participation to be completely voluntary and under your control.

Participant

Date

Edward A. Callaway, Researcher

Date

Participant Interview Questions

1. In what ways did you, as an individual, experience the loss and restoration of the Division's Internet-based communications?

Probes:

- How did you feel about it?
- To what place or places did you move to get your work accomplished?
- Do you believe that leadership has a responsibility to provide tools to get the work accomplished?
- Did the loss or restoration affect your sense of purpose about your work?

2. In what ways did the loss and restoration of the Division's Internet-based communications affect your work-related interpersonal relationships?
 - a. Loss of communication
 - b. Restoration of communication

Probes:

- In what ways, if any, did either one of these events affect your work community connections?

3. In what ways did the loss and restoration of the Division's Internet-based communications affect your personal work process?
 - a. Loss of communication
 - b. Restoration of communication

Probes:

- What do you do to create, sustain, share, or renew knowledge?
- What did you do differently to "make do" in this situation?
- What frustrations did you encounter and how did you address them?

4. In what ways did the loss and restoration of the Division's Internet-based communications affect your personal results?
 - a. Loss of communication
 - b. Restoration of communication

Probes:

- Did the loss or restoration affect your view of who is your customer?
- In what ways did or do you measure your results?

- Did the loss or restoration have any affect on the performance feedback you give or receive?

5. In what ways do you believe that the loss and restoration of the Division's Internet-based communications affected the Division's results?
 - a. Loss of communication
 - b. Restoration of communication

Probes:

- In what ways was your working with others affected by the loss and restoration?
- Did you see this situation as affecting the organizational system?
- Did the loss or restoration have any affect on the performance feedback you give or receive?

6. In what ways, if any, do you understand these loss and restoration events to have any meaningful impact on organizations, in general, or society, as a whole?

Probes:

- Terrorism, such as Pentagon and World Trade Center
- Natural disasters, such as the Texas floods or California earthquake
- Wars, such as in Afghanistan
- Highly integrated systems, such as Department of Interior or an ERP

7. Is there anything else that you would like to tell me about your experience in this situation?

Probes: None

Rationale for Each Participant Interview Question

1. In what ways did you, as an individual, experience the loss and restoration of the Division's Internet-based communications?

Probes:

- How did you feel about it?
- To what place or places did you move to get your work accomplished?
- Do you believe that leadership has a responsibility to provide tools to get the work accomplished? (Leaders' role in ensuring communication; Knowledge worker; Failure)
- Did the loss or restoration affect your sense of purpose about your work? (Knowledge worker)

- a. To which research question does this interview question relate?

This interview question relates to research question #1.

- b. Why is this question included?

This interview question is included to establish rapport between the participant and the researcher.

- c. Why are these probes included?

These probes are used as a method of opening the conversation and to let the participant know that there are no "undiscussable" topics. The topics included in the probes can be included in other interview questions, as the participant addresses them.

2. In what ways did the loss and restoration of the Division's Internet-based communications affect your work-related interpersonal relationships?

- a. Loss of communication
- b. Restoration of communication

Probe:

- In what ways, if any, did either one of these events affect your work community connections? (Knowledge worker)

- a. To which research question does this interview question relate?

This interview question relates to research question #2.

- b. Why is this question included?

This interview question is included because work-related interpersonal relationships are a key element in the theoretical framework.

- c. Why is this probe included?

This probe is included because it is a restatement of the question, but is focused on the participants' workplace community.

3. In what ways did the loss and restoration of the Division's Internet-based communications affect your personal work process?
 - a. Loss of communication
 - b. Restoration of communication

Probes:

- What do you do to create, sustain, share, or renew knowledge? (Knowledge work process)
- What did you do differently to "make do" in this situation? (Failure)
- What frustrations did you encounter and how did you address them?

- a. To which research question does this interview question relate?

This interview question relates to research question #2.

- b. Why is this question included?

This interview question is included because the individual's personal work process is a key element in the theoretical framework.

- c. Why are these probes included?

These probes are included because they relate to the definition of knowledge work process and the participants' actions to produce results.

4. In what ways did the loss and restoration of the Division's Internet-based communications affect your personal results?
 - a. Loss of communication
 - b. Restoration of communication

Probes:

- Did the loss or restoration affect your view of who is your customer? (Results)
- In what ways did or do you measure your results? (Results)
- Did the loss or restoration have any affect on the performance feedback you give or receive? (Results)

- a. To which research question does this interview question relate?

This interview question relates to research question #2.

- b. Why is this question included?

This interview question is included because the individual's personal results are a key element in the theoretical framework.

- c. Why are these probes included?

These probes are included because they relate to the ways in which the participants understand their results.

5. In what ways do you believe that the loss and restoration of the Division's Internet-based communications affected the Division's results?
- Loss of communication
 - Restoration of communication

Probes:

- In what ways was your working with others affected by the loss and restoration? (Results)
- Did you see this situation as affecting the organizational system? (Results)
- Did the loss or restoration have any affect on the performance feedback you give or receive? (Results)

- a. To which research question does this interview question relate?

This interview question relates to research question #3.

- b. Why is this question included?

This interview question is included because Divisional results are a key element in the theoretical framework.

- c. Why are these probes included?

These probes are included because they relate to the participants' understanding of Divisional results.

6. In what ways, if any, do you understand these loss and restoration events to have any meaningful impact on organizations, in general, or society, as a whole?

Probes:

- Terrorism, such as Pentagon and World Trade Center
- Natural disasters, such as the Texas floods or California earthquake
- Wars, such as in Afghanistan
- Highly integrated systems, such as Department of Interior or an ERP

- a. To which research question does this interview question relate?

This interview question relates to research question #5.

- b. Why is this question included?

This question is included because the implications of communications loss and restoration are not well considered because communications are rarely (at least in the United States) lost.

- c. Why are these probes included?

These probes are included to help the participant think about things beyond this situation that may be useful for Chapter 5 or for future work.

7. Is there anything else that you would like to tell me about your experience in this situation?

Probes: None

- a. To which research question does this interview question relate?

This interview question does not relate to any specific research question.

- b. Why is this question included?

This interview question is included to allow the participant to say whatever is on his or her mind.

- c. Why are these probes included?

No probes are included.

APPENDIX B. FINAL EFFECTS LISTING

This Appendix contains three items related to the Final Effects Listing. These items are fundamental to this study and are included, at this point, for the reader's convenience.

The first item is the Final Effects Listing itself, containing all 23 Effects. This listing is included because it provides, on one sheet of paper, all the Effects found in this situation.

The second item is a chart that relates the Final Effects (as numbered 1 through 23) with those identical Effects found in Appendix D (as numbered 1 through 28). The numbering change was made as the researcher combined similar Effects, using the logic of Lincoln & Guba's (1985) negative case analysis (p. 309). The number of individual effects is included on the chart as a convenience.

The third item is a chart, which relates the theoretical framework elements with the Appendix D Effects. (The number of individual effects is included for convenience). The chart is included at this point.

Final Effects Listing

1. The people experienced a range of emotions.
2. Everyone moved.
3. Management did not fulfill its responsibility to provide tools to accomplish the work.
4. The people determined to succeed by getting the work accomplished.
5. Face-to-face interaction is important for office functioning.
6. Some persons were not told how the loss occurred and, more importantly, what to tell their customers.
7. Cohesiveness is important for office functioning.
8. Some people became a communications centers.
9. The people made and implemented new communications plans.
10. The people had to do extra or non-programmatic work, which increased costs.
11. The people used alternative communication modes, such as email accounts and telephones.
12. The people move to new locations, which caused extra effort and time to get the work accomplished.
13. There was no change in the way the people viewed their customers.
14. There was no change in the way the people assessed results.
15. There was increased time and delay to get the work accomplished.
16. Key aspects of office's functioning continued unabated.
17. The office, as a system, was debated.
18. The office's ability to deliver results was debated.
19. The people recognized the need for and importance of business continuity plans.
20. The question "Who are we?" became important.
21. Work quality was not affected.
22. The people created new processes.
23. No effect.

Table 2. Final Effects Listing Related to the Initial Effects Listing in Appendix D

Appendix B Effect Number	Appendix D Effect Number	Appendix D Effect	Number of Individual Effects
1	1	The people experienced a range of emotions.	16
2	2	Everyone moved.	12
3	3	Management did not fulfill its responsibility to provide tools to accomplish the work.	2
4	4	The people determined to succeed by getting the work accomplished.	8
---	5	<i>Incorporated into Effect 3. Deleted. Some people lost respect for ABM & SBM management (R212)</i>	
5	6	Face-to-face interaction is important for office functioning.	11
6	7	Some persons were not told how the loss occurred and, more importantly, what to tell their customers.	4
7	8	Cohesiveness is important for office functioning.	15
8	9	Some people became a communications centers.	7
9	10	The people made and implemented new communications plans.	12
10	11	The people had to do extra or non-programmatic work, which increased costs.	13
11	12	The people used alternative communication modes, such as email accounts and telephones.	7
12	13	The people moved to new locations, which caused extra effort and time to get the work accomplished.	12
13	14	There was no change in the way the people viewed their customers.	3
14	15	There was no change in the way the people assessed results.	1

Appendix B Effect Number	Appendix D Effect Number	Appendix D Effect	Number of Individual Effects
16	17	Key aspects of office's functioning continued unabated.	9
17	18	The office, as a system, was debated.	7
18	19	The office's ability to deliver results was debated.	27
19	20	The people recognized the need for and importance of business continuity plans.	8
--	21	<i>Incorporated into Effect 20. Deleted. Business continuity plans are needed.</i>	
--	22	<i>Incorporated into Effect 20. Deleted. We need to think about the future.</i>	
--	23	<i>Incorporated into Effect 4. Deleted. People will get the job done, no matter what.</i>	
20	24	The question "Who are we?" became important.	10
21	25	Work quality was not affected.	1
22	26	The people created new processes.	20
--	27	<i>Incorporated into Effect 11. Deleted. Cost was impacted, but not in a quantifiable way.</i>	
23	28	No effect.	9
		Individual effects not placed	41
		Total	263

Notes:

- Effect 5 was deleted and its related individual effects were incorporated into Effect 3 because, upon review, the individual effects in both were determined to be similar enough to be considered as one Effect.
- Effects 21, 22, 23, and 27 were treated similarly for the same reason. The Effect numbering, found in Appendix D, was retained for simplicity and maintaining an audit trail.

Table 3. Alignment of the Theoretical Framework Elements and the Appendix D Effects

Theoretical Framework Element	Number of Appendix D Effects	Appendix D Effect Numbers	Number of Individual Effects
Customer	1	14 "There was no change in the way the people viewed their customers."	3
Purpose	0	None	0
Goals	0	None	0
People	3	1 "The people experienced a range of emotions."	16
		4 "The people determined to succeed by getting the work accomplished."	8
		24 "The question of 'Who are we?' became important."	10
Process	11	2 "Everyone moved."	12
		3 "Management did not fulfill its responsibility to provide tools to accomplish the work."	2
		5 "Face-to-face interaction is important for office functioning."	11
		6 "Some persons were not told how the loss occurred and, more importantly, what to tell their customers."	4
		7 "Cohesiveness is important for office functioning."	15
		8 "Some people became a communications centers."	7
		9 "The people made and implemented new communications plans."	12
		11 "The people used alternative communication modes, such as email accounts and telephones."	7
		12 "The people moved to new locations, which caused extra effort and time to get the work accomplished."	12
		17 "The office, as a system, was debated."	7
		22 "The people created new processes."	20

Theoretical Framework Element	Number of Appendix D Effects	Appendix D Effect Numbers	Number of Individual Effects
Technology	1	20 "The people recognized the need for and importance of business continuity plans."	8
Results	6	11 "The people had to do extra or non-programmatic work, which increased costs."	13
		15 "There was no change in the way the people assessed results."	1
		16 "There was increased time and delay to get the work accomplished."	8
		17 "Key aspects of the office's functioning continued unabated."	9
		19 "The office's ability to deliver results was debated."	27
No Effect	1	25 "Work quality was not affected."	1
		28 "No effect."	9
Individual effects not placed			41
Totals	23		263

Notes:

1. The Effect Numbers in the "Appendix D Effect Numbers" column are in the order in which they are found in Chapter 4.
2. The amounts in the "Number of Individual Effects" column are based on the corresponding Appendix E tables

APPENDIX C. STEPS IN THE ANALYSIS PROCESS

This Appendix contains three tables, which are described in Chapter 3.

The first table, Appendix C-1, is an accounting for code words and the related coded segments. The initial coding led to 79 code words and 1072 coded segments. However, 15 code words and their related 107 coded segments were eliminated for a number of reasons, such as history not relevant to the study. Consequently, there were 64 code words and 965 coded segments used in the analysis. This table lists the ones that were used.

Appendix C-2 is an example of the initial listing of individual effects. It was sorted by Number, which was arbitrarily assigned. It shows the assigned Number; when the individual effect occurred; the individual effect itself; the code word and code word item, which serve as the source of the individual item; and the question (Interview Questions 1 through 7 or Other) that relate to the individual effect. This Appendix is an example page of the complete listing of 14 pages. Including the full set of pages does not add value to the study or its conclusions.

Appendix C-3 is another example of the initial listing of individual effects. It is sorted by Interview Question and Other. The columns are the same as Appendix C-2's. The purpose of this sorting was to begin the process of extracting themes, which are found in Appendix D.

Table 4. Code Word and Coded Segments Accounting

Number	Code Word	Cumulative	
		Coded Segments	Coded Segments
1	3AB	94	94
2	WORKDONE	74	168
3	3AC1	71	239
4	1A	69	308
5	1B	58	366
6	1C	41	407
7	5AC	39	446
8	5AA	35	481
9	2AA	31	512
10	FAIL	30	542
11	3AA	28	570
12	3AC2	28	598
13	6D	28	626
14	ACCESS	22	648
15	PHYSICAL	22	670
16	GOODTHG	18	688
17	4AB	17	705
18	COHESIVNS	17	722
19	4AC	16	738
20	5AB	15	753
21	LACKCOMM	13	766
22	IDENTITY	13	779
23	2BA	11	790
24	1D	10	800
25	5BC	10	810
26	3BC1	10	820
27	TRUST	10	830
28	3BA	9	839
29	4AA	8	847
30	FLEXIBLE	6	853

31	INDVDLPM	6	859
32	5BA	6	865
33	3BB	6	871
34	STANDUP	6	877
35	WALK	5	882
36	WARN	5	887
37	4BB	5	892
38	PURPOSE	5	897
39	6A	5	902
40	1E	5	907
41	IM	4	911
42	GOALS	4	915
43	3AD	4	919
44	4BC	4	923
45	5BB	4	927
46	VIRTORG	4	931
47	SPVSN	4	935
48	COMPLEX	3	938
49	2AB	3	941
50	6B	3	944
51	CONTROL	3	947
52	MISSION	2	949
53	5AD	2	951
54	4BA	2	953
55	3AB1	2	955
56	LRND	2	957
57	STAFFING	1	958
58	ECLECTIC	1	959
59	3BD	1	960
60	4AD	1	961
61	3BC2	1	962
62	ORGREL	1	963
63	ORGMATTERS	1	964
64	ORGNAT	1	965
	Total Coded Segments		<u>965</u>

Gross Total Code Word Count 79
Code Words Deleted 15

Adjusted Total Code Word Count	<u>64</u>
Gross Total Coded Segment Count	1072
Coded Segments Deleted	107
5 Coded Segments Moved	
Adjusted Total Coded Segment Count	<u>965</u>

APPENDIX C-2

Full List of Effects

EXAMPLE ONLY

Number	Individual Effect		Code Word	Code		
	Caused at	Individual Effect		Word Item	Related to Questions	Related to Other
1	L	Running between floors helped maintain community connections	GOODTHG	1	2	
2	B	SBM and ABM were on same network, DNHN	GOODTHG	2		Resources
3	L	Forced us to have more robust planning and face-to-face interactions with customers	GOODTHG	3	2	
4	R	Being on DNHN gave us a sense of permanency	GOODTHG	4		Identity
5	L	We learned to be as effective from a distance as we can in the office	GOODTHG	5	3, 4	
6	L	We learned to be more sympathetic to the people going through implementation of our systems	GOODTHG	6	2	
7	L	We have improved processes.	GOODTHG	7	3	
8	B	We have the potential for management improvements	GOODTHG	8		Process
9	B	Individuals thought through their work processes and did some things differently	GOODTHG	9	3	
10	L	Two people did not feel comfortable using 5th floor facilities	IDENTITY	1		Identity
11	B	SBM underwent a profound change in identity	IDENTITY	4		Identity

APPENDIX C-3

Full List of Effects Sorted by Interview Question & "Other"

EXAMPLE ONLY

Number	Individual Effect Caused by	Individual Effect	Code Word	Item	Questions	Other
28	L.	Frustration at loss of control of individual's work site and tools	CONTROL	1	1	
29	L.	Frustration at inability to get the job done with appropriate tools	CONTROL	2	1	
31	L.	People changed locations to work	PHYSICAL	1	1	
58	L.	Changed the person's work location and commute	VIRTORG	2	1	
77	L.	I was not surprised (for several reasons)	1A	1	1	
78	L.	I was challenged	1A	2	1	
79	L.	I was frustrated (for several reasons)	1A	3	1	
80	L.	no effect (for several reasons)	1A	4	1	
81	L.	I was surprised (for several reasons)	1A	5	1	
82	L.	It was annoying, stupid, ridiculous, unnecessary	1A	6	1	
83	L.	It was crippling, debilitating. I could not do my job there, so I left.	1A	7	1	
84	L.	It changed my attitude about the office	1A	8	1	
85	L.	I felt a loss of community	1A	9	1	

APPENDIX D. INITIAL EFFECTS LISTING

1. The people experienced a range of emotions. (R1I1)
2. Everyone moved. (R1I1)
3. Management did not fulfill its responsibility to provide tools to accomplish the work. (R1I1)
4. The people determined to succeed by getting the work accomplished. (R1I1)
5. Some people lost respect for ABM and SBM management. (R2I2)
6. Face-to-face interaction is important for office functioning. (R2I2)
7. Some persons were not told how the loss occurred and, more importantly, what to tell their customers. (R2I2)
8. Cohesiveness is important for office functioning. (R2I2)
9. Some people became a communications centers. (R2I3)
10. The people made and implemented new communications plans. (R2I3)
11. The people had to do extra or non-programmatic work, which increased costs. (R2I3)
12. The people used alternative communication modes, such as email accounts and telephones. (R2I3)
13. The people moved to new locations, which caused extra effort and time to get the work accomplished. (R2I3)
14. There was no change in the way the people viewed their customers. (R2I4)
15. There was no change in the way the people assessed results. (R2I4)
16. There was increased time and delay to get the work accomplished. (R3I5)
17. Key aspects of office's functioning continued unabated. (R3I5)
18. The office, as a system, was debated. (R3I5)
19. The office's ability to deliver results was debated. (R3I5)
20. The people recognized the need for and importance of business continuity plans. (R4I6)
21. Business continuity plans are needed. (R4I6)
22. We need to think about the future. (R4I6)
23. People will get the job done, no matter what. (Other)
24. The question "Who are we?" became important. (Other)
25. Work quality was not affected. (R3I5)
26. The people created new processes. (R2I3)
27. Cost was impacted, but not in a quantifiable way. (R3I5)
28. No effect.

Notes:

1. The parenthetical expression at the end of each effect indicates the Research and Interview Question from which the effect primarily and initially evolved. As the Effects listing was reviewed, similar items were combined from disparate Questions; thereby, the Final Effects Listing was created. For example, the expression related to Effect 21 is (R4I6), which means Research Question 4 and Interview Question 6. The parenthetical (Other) means that this Effect evolved from the ideas not directly related to an Interview Question, but were significant enough to be captured.

APPENDIX E. FULL LIST OF INDIVIDUAL EFFECTS

This Appendix contains one table, which contains the full list of individual effects and the Effect to which they are related, as described in Chapter 3.

The Individual Effect Number is the number assigned, as noted in Appendix C. The “Individual Effect Caused by” column captures the time at which the individual effect occurred, as experienced by the participants. The “Individual Effect” column contains the individual effects, as grouped by the researcher. The “Code Word” and “Item” columns are identical to those of Appendix C. The “Number of Participant Comments” column has the number of times the participants made a comment, which was classified as related to each particular individual effect. The “Appendix D Effect Number” column is used to group the individual effects, as part of the process of naming the Effects found in Appendix D. The “Related to Question” column gives an indication of the Interview Question to which the comments are related; the Code Words and Items, not the interview questions, were the key element in this listing.

The listing was sorted, first, by Appendix D Effect Number and, second, by Number of Participant Comments. This sorting process was necessary to gather all the individual effects that illuminated an Effect in one place and to show the relative strength, as demonstrated by participant comments, among the individual effects. There are two informational rows at the end of each sorted grouping. The first one, “Number of individual effects,” is a simple count of the individual effects. The second row contains the precise Appendix D Effect Number—that is, the themes that evolved from the study—as numbered and worded.

Full List of Individual Effects Sorted by Appendix D Effect Number

Individual Effect Number	Individual Effect Caused by	Individual Effect	Code Word	Item	Number of Participant Comments	Appendix D Effect Number	Related to Question
79	L	I was frustrated (for several reasons)	1A	3	11	E 1	1
82	L	It was annoying, stupid, ridiculous, unnecessary	1A	6	9	E 1	1
88	L	I felt professionally diminished	1A	12	6	E 1	1
78	L	I was challenged	1A	2	4	E 1	1
86	L	It was disappointing	1A	10	4	E 1	1
81	L	I was surprised (for several reasons)	1A	5	3	E 1	1
77	L	I was not surprised (for several reasons)	1A	1	3	E 1	1
83	L	It was crippling, debilitating. I could not do my job there, so I left.	1A	7	2	E 1	1
84	L	It changed my attitude about the office	1A	8	2	E 1	1
85	L	I felt a loss of community	1A	9	2	E 1	1
92	R	I felt a devastating loss with no IM capability	1A	16	2	E 1	1
28	L	Frustration at loss of control of individual's work site and tools	CONTROL	1	2	E 1	1
29	L	Frustration at inability to get the job done with appropriate tools	CONTROL	2	2	E 1	1
90	L	I felt that leadership did nothing	1A	14	1	E 1	1
91	L	I felt relief because less work was required	1A	15	1	E 1	1
105	L	Person felt blamed for the loss	1E	1	1	E 1	1
<p>Number of individual effects: 16 Appendix D Effect Number 1: The people experienced a range of emotions</p>							

The Effects of Workplace Internet-Based Communication Changes

93	L.	Everyone moved somewhere	1B	1	38	E	2	1
133	L.	Moved to a new location	3AB	3	16	E	2	3
87	L.	Moving was positive and negative	1A	11	7	E	2	1
49	L.	We changed work locations	WORKDONE	2	4	E	2	3
152	L.	Work could not be accomplished at the SBM office	3AC	4	3	E	2	3
175	L.	Relocated as possible, with office in a bag	3AC2	6	3	E	2	3
97	R	We moved back	1B	5	2	E	2	1
96	L.	SBM ceased to be a place of work accomplishment.	1B	4	1	E	2	1
95	L.	Moving saved us; we stayed an effective office. Not to move would have destroyed us.	1B	3	1	E	2	1
31	L.	People changed locations to work	PHYSICAL	1	1	E	2	1
58	L.	Changed the person's work location and commute	VIRTORG	2	1	E	2	1
44	L.	Frustrated because people were not in the office to accomplish work	WORKDONE	6	1	E	2	3
<hr/>								
Number of individual effects: 12								
Appendix D Effect Number 2: Everyone moved								
<hr/>								

98	L.	People assessed that management had a responsibility and did not fulfill it	1C	1	37	E	3	1
16	L.	Management failed to provide tools	FAIL	1	32	E	3	2

Number of individual effects: 2

Appendix D Effect Number 3: Management did not fulfill its responsibility to provide tools to accomplish the work.

39	B	People are mission focused and will get the job done no matter what	WORKDONE	1	31	E 4	Other
131	L	We had to figure out what to do	3AB	1	11	E 4	3
102	L	Their sense of purpose about the work was not affected	1D	1	10	E 4	1
155	L	Spending personal funds to get Government's work done	3AC	7	5	E 4	3
214	L	Loss made it hard to do our jobs	5AA	5	2	E 4	5
103	L	Gained a sense of pride in persevering and succeeding in spite of the situation	1D	2	1	E 4	1
104	L	Heightened my sense of purpose	1D	3	1	E 4	1
176	L	Personally paid for email and cell phone usage	3AC2	7	1	E 4	3

Number of individual effects: 8

Appendix D Effect Number 4: The people determined to succeed by getting the work accomplished.

110	L	Highlighted the need for face-to-face contact	2AA	3	13	E 6	2
62	L	Caused people to focus on customer service	ACCESS	2	8	E 6	2
76	L	Highlighted consultant's need for face-to-face contact	TRUST	2	5	E 6	2

3	L.	Forced us to have more robust planning and face-to-face interactions with customers	GOODTHG	3	3	E	6	2
121	L.	Being physically in SBM spaces is required	2AB	4	2	E	6	2
169	L.	Robbed me of the human aspect of my job	3AC	21	2	E	6	3
173	L.	Kept coming to office for face time and to fight irrelevance	3AC2	4	2	E	6	3
210	L.	Effectuated working with other contractors/Reserves	5AA	1	2	E	6	5
160	L.	Lost my face time	3AC	12	1	E	6	3
68	L.	Decreased our face-to-face contact	COHESIVENS	2	1	E	6	2
70	L.	Realized that interpersonal relationships are important	COHESIVENS	4	1	E	6	2
<hr/> <p>Number of individual effects: 11 Appendix D Effect Number 6: Face-to-face interaction is important for office functioning.</p> <hr/>								
22	L.	No one told me the story or when it would be fixed	LACKCOMM	2	9	E	7	2
163	L.	No one told us what the situation was and what to tell our customers	3AC	15	6	E	7	3
23	B	No one told me what to tell our customers	LACKCOMM	3	4	E	7	2
21	L.	Showed that the communications about the loss were limited and ineffective	FAIL.	6	3	E	7	2
<hr/> <p>Number of individual effects: 4 Appendix D Effect Number 7: Some persons were not told how the loss occurred and, more importantly, what to tell their customers.</p> <hr/>								
69	L.	Caused loss of cohesiveness	COHESIVENS	3	6	E	8	2

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115	L	Cohesiveness splintered	2AA	8	3	E 8	2
217	L	Disruptive to the office itself, as a team	5AA	8	3	E 8	5
67	L	Increased our cohesiveness with KPMG counterparts	COHESIVENS	1	2	E 8	2
18	L	Loss of community within SBM	FAIL	3	2	E 8	2
54	L	Some persons focused on getting their jobs done and ignored the team	INDVDLPM	2	2	E 8	2
111	L	Had no relationships; no one was here	2AA	4	1	E 8	2
119	R	Person believes the SBM team is starting to rebuild	2AB	2	1	E 8	2
208	L	Person learned that he can do what he needs to do from a physical distance	4AD	1	1	E 8	4
240	L	Loss of cohesiveness	5AD	2	1	E 8	5
72	R	Cohesiveness did not return	COHESIVENS	6	1	E 8	2
73	R	Cohesiveness has grown markedly	COHESIVENS	7	1	E 8	2
5	L	We learned to be as effective from a distance as we can in the office	GOODTHG	5	1	E 8	4
56	R	No team rematerialized	INDVDLPM	4	1	E 8	2
36	L	Separation caused relationship damage	PHYSICAL	6	1	E 8	2

Number of individual effects: 15

Appendix D Effect Number 8: Cohesiveness is important for office functioning.

140	L	Became a communications center (distribution, comm, print)	3AB	10	7	E 9	3
150	L	Becoming a communications center	3AC	2	6	E 9	3

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127	I.	We did different things to get the job done	3AA	2	5	E 9	3
172	L.	Became a communications center (distribution, comm, print)	3AC2	3	4	E 9	3
52	R	We stopped doing the interim things	WORKDONE	5	4	E 9	3
108	L.	Person did different things	2AA	1	2	E 9	2
154	L.	Insufficient analog lines to provide alternate communications	3AC	6	1	E 9	3
Number of individual effects: 7							
Appendix D Effect Number 9: Some people became communications centers.							
148	L.	Changed my personal communications process	3AB	18	7	E 10	3
122	L.	Created a new personal communication plan	3AA	1	4	E 10	3
136	L.	I had to change my personal address book to get messages to people	3AB	6	3	E 10	3
20	L.	Showed one person the need for improving his communication process	FAIL.	5	3	E 10	3
25	L.	Individual walks around the spaces more	WALK	1	3	E 10	3
26	L.	The walks have improved my communications with the people	WALK	2	3	E 10	3
123	L.	Created a new SPS communications strategy	3AA	1	2	E 10	3
135	L.	Made new communication methods	3AB	5	2	E 10	3
180	R	Created an IM network	3BA	2	2	E 10	3
9	B	Individuals thought through their work processes and did some things differently	GOODTHG	9	2	E 10	3

24	L	Individual learned that prior communication pattern was ineffective	LRND	2	1	E 10	3
27	L	Caused the individual to realize that he needed to be on the 4th floor more frequently	WALK	3	1	E 10	3

Number of individual effects: 12

Appendix D Effect Number 10: The people made and implemented new communications plans.

156	L	Lost material (files and distribution lists)	3AC	8	8	E 11	3
151	L	Causing needless and unidentifiable opportunity costs	3AC	3	3	E 11	3
190	R	Cost time and effort in lost access to needed files	3BC1	3	3	E 11	3
99	L	It led to wasted time and effort	1C	2	2	E 11	1
112	L	Negatively affected productivity	2AA	5	1	E 11	2
184	R	Check 2 email accounts every day because some users refuse to switch	3BA	6	1	E 11	3
189	R	Cost time and effort in address change emails and other admin activity	3BC1	2	1	E 11	3
191	R	Cost time and effort in redoing stuff (e.g. files)	3BC1	4	1	E 11	3
192	R	Cost time and effort in checking two accounts every day	3BC1	5	1	E 11	3
195	R	Lost access to things/files	3BC2	2	1	E 11	3
238	L	It wasted management time	5AC	10	1	E 11	5
63	L	Caused duplicate/unnecessary work	ACCESS	3	1	E 11	3

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17	L	Wasted time on problem; therefore, lost time for working on office's mission	FAIL	2	1	E 11	Other
<p>Number of individual effects: 13</p> <p>Appendix D Effect Number 11: The people had to do extra or non-programmatic work, which increased costs.</p>							
132	L	Used other communication modes or work arounds	3AB	2	22	E 12	3
134	L	Obtained new or used other/alternate email addresses	3AB	4	15	E 12	3
40	L	Alternate communications modes were used	WORKDONE	2	15	E 12	3
171	L	Used alternative communication modes and email accounts	3AC2	2	10	E 12	3
66	L	We used alternate communication modes	ACCESS	6	9	E 12	3
142	L	Used 2 analog lines for modems	3AB	12	4	E 12	3
64	L	Person gained an alternate communication mode -- supervisor's cell phone	ACCESS	4	1	E 12	3
<hr/> <p>Number of individual effects: 7</p> <p>Appendix D Effect Number 12: The people used alternative communication modes, such as email accounts and telephones.</p> <hr/>							
137	L	Running around to find people, which added process steps	3AB	7	8	E 13	3
45	L	Caused people to work from different locations	WORKDONE	7	8	E 13	3

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149	L	Running around to find people, which added needless cost and delay	3AC	1	5	E 13	3
94	L	More running around was needed to get things finished	1B	2	4	E 13	1
153	L	Moving to a less accommodating workplace	3AC	5	3	E 13	3
170	L	Running around to find folks	3AC2	1	3	E 13	3
177	L	Went to place with the files (up or down)	3AC2	8	3	E 13	3
186	R	It is easier to find people	3BB	2	2	E 13	3
138	L	Had to return to SBM site to obtain information	3AB	8	1	E 13	3
183	R	Walk around if face-to-face meeting is needed	3BA	5	1	E 13	3
185	R	No longer has to move around; does not need office in a bag	3BB	1	1	E 13	3
242	R	Split the team between two locations	5BA	2	1	E 13	5
<hr/>							
Number of individual effects: 12							
Appendix D Effect Number 13: The people moved to new locations, which caused extra effort and time to get work accomplished.							
199	L	No effect on view of customer	4AA	1	6	E 14	4
200	L	No, but person had to make a deliberate decision about who would receive what email	4AA	2	1	E 14	4
201	L	No, but person had to stay in close connection with others	4AA	3	1	E 14	4
<hr/>							
Number of individual effects: 3							
Appendix D Effect Number 14: There was no change in the way the people viewed their customer.							
<hr/>							

202	L.	No change from qualitative and quantitative processes	4AB	1	15	E 15	4
<hr/> Number of individual effects: 1 Appendix D Effect Number 15: There was no change in the way the people assessed results.							
161	L.	Unable to do my job on a timely basis	3AC	13	4	E 16	3
248	R	Things took longer for unknown reasons	5BC	3	3	E 16	5
157	L.	Breakdowns in communication because people are separated and cannot stay on the same page	3AC	9	2	E 16	3
231	L.	Things took longer, no affect on quality	5AC	3	2	E 16	5
204	L.	Things slowed down	4AB	3	1	E 16	4
221	L.	Caused unneeded work	5AA	12	1	E 16	5
222	L.	Increase in time/delay	5AA	13	1	E 16	5
239	L.	Increased cycle time	5AD	1	1	E 16	5
<hr/> Number of individual effects: 8 Appendix D Effect Number 16: There was increased time and delay to get the work accomplished.							
233	L.	All work was performed as normal/expected/required	5AC	5	7	E 17	5
124	L.	We could share knowledge and solve problems better by being the same location	3AA	1	4	E 17	3
35	L.	Team became co-located and became more effective	PHYSICAL	5	4	E 17	3
232	L.	Trouble ticket volume increased and decreased	5AC	4	3	E 17	5
218	L.	Significant things (e.g. budget, contracts, IPTs) continued unabated	5AA	9	2	E 17	5

236	L	More work was completed	5AC	8	2	E 17	5
120	L	It is harder to work with the people at the KPMG site	2AB	3	1	E 17	2
224	L	Much less collaborative work	5AA	15	1	E 17	5
246	R	We were able to monitor the network the users use	5BC	1	1	E 17	5
<hr/>							
Number of individual effects: 9							
Appendix D Effect Number 17: Key aspects of the office's functioning continued unabated.							
<hr/>							
225	L	No effect on office, as a system	5AB	1	4	E 18	5
228	L	Organization profoundly became ABM	5AB	4	4	E 18	5
38	R	Effectiveness deteriorated	PHYSICAL	8	4	E 18	5
226	L	Organization was weakened	5AB	2	2	E 18	5
244	R	No effect on office, as a system	5BB	1	2	E 18	5
227	L	Organization became dysfunctional	5AB	3	1	E 18	5
245	R	Agnostic	5BB	2	1	E 18	5
<hr/>							
Number of individual effects: 7							
Appendix D Effect Number 18: The office, as a system, was debated.							
<hr/>							
234	L	Customers were angry/in disbelief	5AC	6	12	E 19	5
211	L	Strained relationships with customers, JPMO	5AA	2	10	E 19	5
207	L	SBM lost credibility in eyes of its customers	4AC	2	9	E 19	4
235	L	Damaged image	5AC	7	6	E 19	5
165	L	Lost credibility with customers	3AC	17	5	E 19	3
100	L	It negatively affected SBM in its leadership role with the Commands	1C	3	4	E 19	1

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129	L.	More robust planning and execution	3AA	4	4	E 19	3
213	L.	Used alternative communication modes to meet customer needs	5AA	4	4	E 19	5
220	L.	Put us in a bad light	5AA	11	3	E 19	5
241	R	People have DNIN accounts, that are good for credibility	5BA	1	3	E 19	5
15	R	Returning to SBM spaces caused a loss of IM capability and a reduced work effectiveness	IM	2	3	E 19	3
41	L.	Customers and others were affected	WORKIDONE	3	3	E 19	5
254	L.	Alternative communications methods saved the office's ability to perform	6D	2	2	E 19	6
19	L.	Loss of credibility to outsiders	FAIL.	4	2	E 19	2
101	R	Restoration restored credibility	IC	4	1	E 19	1
116	L.	Some users held us at arm's length	2AA	9	1	E 19	2
168	L.	My productivity was harmed	3AC	20	1	E 19	3
215	L.	Claimants were comfortable with contractors	5AA	6	1	E 19	5
216	L.	Claimants were tolerant	5AA	7	1	E 19	5
237	L.	Claimants exhibited tolerance	5AC	9	1	E 19	5
247	R	Users gained confidence and sent us files again	5BC	2	1	E 19	5
50	L	We were forced to confront Front Office customer demands	FLEXIBLE	3	1	E 19	5
<hr/> <p>Number of individual effects: 27 Appendix D Effect Number 19: The office's ability to deliver results was debated.</p> <hr/>							
253	L.	Backups/alternative/second sources are needed	6D	1	16	E 20	6
257	L.	Business continuity plan	6D	5	10	E 20	6

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252	L	Integrated systems increase organizational vulnerability	6B	1	2	E 20	6
249	L	Loss of strategic advantage, time, credibility	6A	1	1	E 20	6
259	L	Highlighted vulnerability	6D	7	1	E 20	6
255	L	Step backward in the communications chain	6D	3	1	E 20	6
258	L	Use available items; do not create new ones	6D	6	1	E 20	6
57	L	Forced the individual to consider organizational complexity and managing in the future	VIRTORG	1	1	E 20	6

Number of individual effects: 8

Appendix D Effect Number 20: The people recognized the need for and importance of business continuity plans.

13	L	Forced us to see our self-definition as "paperless," "flexible," and "high tech office."	IDENTITY	6	4	E 24	Other
53	L	Unmasked individual behaviors	INDVDLPM	1	4	E 24	Other
71	L	Revealed "true nature" of the office	COHESIVENS	5	3	E 24	Other
2	B	SBM and ABM were on same network, DNHN	GOODTHG	2	3	E 24	Other
4	R	Being on DNHN gave us a sense of permanency	GOODTHG	4	2	E 24	Other
11	B	SBM underwent a profound change in identity	IDENTITY	4	2	E 24	Other
10	L	Two people did not feel comfortable using 5th floor facilities	IDENTITY	1	2	E 24	Other
12	L	Forced us to recognize that SBM was a different organization, not integrated in ABM, and not recognized as part of ABM	IDENTITY	2, 5	2	E 24	Other

47	L	Caused us to think about "who we are"	FLEXIBLE	1	1	E 24	Other
1	L	Running between floors helped maintain community connections	GOODTHG	1	1	E 24	2
Number of individual effects: 10							
Appendix D Effect Number 24: The question "Who are we?" became important.							
43	L	No effect on work quality	WORKDONE	4	8	E 25	5
Number of individual effects: 1							
Appendix D Effect Number 25: Work quality was not affected.							
37	R	People changed work processes	PHYSICAL	7	8	E 26	3
32	B	People changed work processes	PHYSICAL	2	5	E 26	3
113	L	Moving to KPMG made work and IM easier because people were there	2AA	6	4	E 26	2
130	L	Created new procedures	3AA	5	2	E 26	3
174	L	Planned email times (do now, send later)	3AC2	5	2	E 26	3
125	L	Created ad hoc systems	3AA	1	1	E 26	3
126	L	Learned new skills	3AA	1	1	E 26	3
139	L	Used voice mail to screen phone calls	3AB	9	1	E 26	3
141	L	Had to plan time to access email	3AB	11	1	E 26	3
143	L	Had to call in lieu of using email	3AB	13	1	E 26	3
147	L	Used paper transactions in lieu of electronic ones	3AB	17	1	E 26	3
164	L	My job became paper-based in lieu of electronic	3AC	16	1	E 26	3
178	L	Temporary fix becomes permanent	3AD	1	1	E 26	3

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182	R	Periodic check-in because our team was separated	3BA	4	1	E 26	3
181	R	Needed to adapt email, IM, and problem escalation rules	3BA	3	1	E 26	3
7	L	We have improved processes.	GOODTHG	7	1	E 26	3
14	B	Created IM networks for problem solving	IM	1	1	E 26	3
55	L	Temporary fix becomes permanent	INDVDLPM	3	1	E 26	3
75	L	Contractors were trusted to act for us	TRUST	1	1	E 26	3

Number of individual effects: 20

Appendix D Effect Number 26: The people created new processes.

118	L	No effect	2AB	1	7	E 28	2
206	L	No effect	4AC	1	6	E 28	4
80	L	No effect	1A	4	5	E 28	1
109	L	No effect	2AA	2	3	E 28	2
65	B	No effect; they had to meet my requirements	ACCESS	5	3	E 28	Other
229	L	No effect	5AC	1	2	E 28	5
128	L	No effect	3AA	3	1	E 28	3
179	R	No effect	3BA	1	1	E 28	3
193	R	No effect	3BC1	6	1	E 28	3

Number of individual effects: 9

Appendix D Effect Number 28: No effect.

34	B	Highlighted need for comfortable working conditions	PHYSICAL	4	7		Other
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8	B	We have the potential for management improvements	GOODTHG	8	5	Other
159	L	Lost communication ability with others not on the SBM network	3AC	11	4	3
48	L	We changed processes	WORKDONE	2	4	3
42	L	Caused a concern about getting the work done	WORKDONE	5	4	5
117	L	Disrupted our communications	2AA	10	3	2
203	L	Good things happened	4AB	2	3	4
74	L	Caused the person to visit the 4th floor and wonder "who is in charge?"	SPVSN	1	3	3
60	L	Caused a person to think about customer's needs	VIRTORG	3	3	5
33	L	Highlighted need to use Government space effectively	PHYSICAL	3	2	Other
46	B	Caused realization the worklife quality affects work accomplished	WORKDONE	8	2	Other
89	L	I saw it as an opportunity to achieve my goal	1A	13	1	1
106	L	Helped person define his priorities in providing service	1E	2	1	1
107	R	Achieved his objective of getting everyone on DNHN	1E	3	1	1
114	L	Person was torn between KPMG and SBM spaces	2AA	7	1	2
144	L	Had to be more aware of people's locations, their cell phone numbers, and phone numbers	3AB	14	1	3
145	L	Used both a desktop and a laptop	3AB	15	1	3
146	L	Used laptop in lieu to desktop to avoid moving	3AB	16	1	3

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158	L	Lost better communications connection	3AC	10	1	3
162	L	Lost job opportunities because the people could not email me	3AC	14	1	3
166	L	Lost workplace stability	3AC	18	1	3
167	L	I have another hurdle to get my job done	3AC	19	1	3
187	R	Things went back to normal	3BB	3	1	3
188	R	Frustrated that the political solution was so hard, when the technical solution was easy	3BC1	1	1	3
194	R	Things went back to normal	3BC2	1	1	3
196	R	Cannot store as much as before on the network	3BC2	3	1	3
197	R	Went back to normal/as before	3BD	1	1	3
198	R	New network connection is slow	3BD	2	1	3
205	L	Morale declined	4AB	4	1	4
209	R	More difficult to keep a pulse on the team at the other location	4BC	1	1	4
212	L	Our fixes were positive	5AA	3	1	5
219	L	Communications were difficult	5AA	10	1	5
223	L	Some internal meetings stopped	5AA	14	1	5
230	L	Not certain	5AC	2	1	5
243	R	Group gained access to files they needed	5BA	3	1	5
250	L	Communications loss interferes with work accomplishment	6A	2	1	6
251	L	Communications loss makes a bad thing (e.g. attack) even worse	6A	3	1	6
256	L	Mitigate risk	6D	4	1	6
61	L	Caused person to focus on organizational issue	ACCESS	1	1	2

6	I.	We learned to be more sympathetic to the people going through implementation of our systems	GOODTHG	6	1	2
30	I.	Individual examined how he would align his technology with his customer's needs	PURPOSE	1	1	Other
59	I.	Changed the person's view on professional matters	VIRTORG	2	1	4
Number of individual effects: 41						

APPENDIX F. CODE BREAKDOWN BY WORK CLUSTER

This Appendix F contains a table, which breaks down certain Code Words by Work Cluster. A full explanation is included in Chapter 3.

Code Breakdown by Work Cluster

		FO Leaders		FO Admin		All SBM People		Help Desk		SBM less two		Three Admin		Three Leaders	
		Coded	Cum	Coded	Cum	Coded	Cum	Coded	Cum	Coded	Cum	Coded	Cum	Coded	Cum
Number	Code Word	Sgmts	Sgmts	Sgmts	Sgmts	Sgmts	Sgmts	Sgmts	Sgmts	Sgmts	Sgmts	Sgmts	Sgmts	Sgmts	Sgmts
1	3AB	15	15	9	9	53	53	17	17	43	43	14	14	20	20
2	WORKDONE	12	27	4	13	41	94	17	34	28	71	10	24	19	39
3	3AC1	5	32	5	18	44	138	16	50	32	103	12	36	10	49 X
4	1A	7	39	1	19	45	183	16	66	41	144	2	38	10	59 X
5	1B	5	44	2	21	40	223	11	77	30	174	6	44	11	70 X
6	1C		44		21	26	249	15	92	20	194	1	45	5	75 X
7	5AC		44		21	29	278	9	101	21	215	1	46	7	82 X
8	5AA	7	51		21	25	303	3	104	14	229	1	47	17	99 X
9	2AA		51		21	24	327	7	111	24	253		47		99 X
10	FAIL	3	54		21	21	348	6	117	14	267		47	10	109 X
11	3AA	8	62	3	24	9	357	8	125	8	275	4	51	8	117
12	3AC2		62	1	25	26	383	1	126	21	296	1	52	5	122 X

13	6D	9	71	25	17	400	2	128	14	310	52	12	134
14	ACCESS	10	81	25	12	412		128	10	320	52	12	146
15	PHYSICAL	3	84	25	5	417	14	142	4	324	52	4	150 X
16	GOODTHG	10	94	25	6	423	2	144	6	330	52	10	160
17	4AB	1	95	25	12	435	4	148	11	341	52	2	162
18	COHESIVNS	4	99	25	11	446	2	150	9	350	52	6	168
19	4AC		99	25	9	455	7	157	8	358	1	53	168
20	5AB		99	25	12	467	3	160	11	369	53	1	169
21	I.ACKCOMM		99	25	1	468	12	172	1	369	1	54	169 X

APPENDIX G. CODE BREAKDOWN BY GENDER

This Appendix G contains a table, which breaks down certain Code Words by gender. A full explanation is included in Chapter 3.

Code Breakdown by Gender with Per Capita and Per Capita Ratio Calculations

		10 Males		8 Females		Per	Per	Male to	Female
		Coded	Cum Coded	Coded	Cum Coded	Capita Coded	Capita Coded	Female Per Capita Ratios	Male to Female Per Capita Ratios
Number	Code Word	Sgmts	Sgmts	Sgmts	Sgmts	Sgmts	Sgmts		
1	3AB	58	58	36	36	5.8	4.5	1.3	0.8
2	WORKDONE	47	105	27	63	4.7	3.4	1.4	0.7
3	3AC1	33	138	37	100	3.3	4.6	0.7	1.4
4	1A	44	182	25	125	4.4	3.1	1.4	0.7
5	1B	32	214	26	151	3.2	3.3	1.0	1.0
6	1C	15	229	26	177	1.5	3.3	0.5	2.2 X
7	5AC	19	248	19	196	1.9	2.4	0.8	1.3
8	5AA	21	269	14	210	2.1	1.8	1.2	0.8
9	2AA	18	287	13	223	1.8	1.6	1.1	0.9
10	FAIL	12	299	18	241	1.2	2.3	0.5	1.9
11	3AA	21	320	7	248	2.1	0.9	2.4	0.4 X
12	3AC2	18	338	10	258	1.8	1.3	1.4	0.7

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13	6D	21	359	7	265	2.1	0.9	2.4	0.4	X
14	ACCESS	16	375	6	271	1.6	0.8	2.1	0.5	X
15	PHYSICAL	16	391	6	277	1.6	0.8	2.1	0.5	X
16	GOODTHG	14	405	4	281	1.4	0.5	2.8	0.4	X
17	4AB	12	417	5	286	1.2	0.6	1.9	0.5	
18	COHESIVNS	10	427	7	293	1	0.9	1.1	0.9	
19	4AC	8	435	8	301	0.8	1.0	0.8	1.3	
20	5AB	10	445	5	306	1	0.6	1.6	0.6	
21	LACKCOMM		445	12	318	0	1.5	0.0	#DIV/0!	X
22	IDENTITY	5	450	7	325	0.5	0.9	0.6	1.8	
23	2BA	8	458	3	328	0.8	0.4	2.1	0.5	X
24	1D	7	465	3	331	0.7	0.4	1.9	0.5	
25	5BC	10	475		331	1	0.0	#DIV/0!	0.0	X

APPENDIX H. DATA FOR ASSESSMENT OF PROBE'S USEFULNESS

This Appendix H contains a table, which captures the code words and their coded segments related to the Interview Questions. A full explanation is included in Chapter 3.

The two matrices on the right side of the table are included for accounting purposes. The top matrix is the relevant one because only Interview Questions 2, 3, 4, and 5 had probes. However, the lower matrix is included for data integrity.

Data for Assessment of Probes' Usefulness

Number	Code Word	Coded Segments	Cumulative Coded Segments	Number of Coded Segments about		
				Question Number	Loss (Question A)	Restoration (Question B)
1	1A	69	69	2	34	11
2	1B	58	127	3	227	27
3	1C	41	168	4	42	11
4	1D	10	178	5	91	20
5	1E	5	183	Totals	394	69
6	2AA	31	214	Total Questions 2, 3, 4, and 5		
7	2AB	3	217			463
8	2BA	11	228			
9	3AA	28	256			
10	3AB	94	350			
				<u>Accounting</u>		
11	3AB1	2	352	Question 1		183
12	3AC1	71	423	Questions 2, 3, 4, and 5		463
13	3AC2	28	451	Question 6		36
14	3AD	4	455	Total		682
15	3BA	9	464			
16	3BB	6	470			
17	3BC1	10	480			
18	3BC2	1	481			

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19	3BD	1	482
20	4AA	8	490
21	4AB	17	507
22	4AC	16	523
23	4AD	1	524
24	4BA	2	526
25	4BB	5	531
26	4BC	4	535
27	5AA	35	570
28	5AB	15	585
29	5AC	39	624
30	5AD	2	626
31	5BA	6	632
32	5BB	4	636
33	5BC	10	646
34	6A	5	651
35	6B	3	654
36	6D	28	682

APPENDIX I. CODE WORDS AND INTERVIEW QUESTIONS

This Appendix I has two parts. The first part is a set of charts entitled "Relationship Between Interview Questions and Code Words." The second is a set entitled "Explanation of Code Words Added During the Coding Process."

The purpose of these charts is to allow easy interpretation of the code words used in Appendices F, G, and H.

Table 5. Relationship Between Interview Questions and Code Words

Code Word	Number of Coded Segments	Interview Question and Related Probes
1	----	In what ways did you, as an individual, experience the loss and restoration of the Division's Internet-based communications?
1A	69	How did you feel about it?
1B	58	To what place or places did you move to get your work accomplished?
1C	41	Do you believe that leadership (in the organizational structure sense) has a responsibility to provide tools to get the work accomplished?
1D	10	Did the loss or restoration affect your sense of purpose about your work?
1E	5	Is there anything else you would like to add?
2A	----	In what ways did the loss and restoration of the Division's Internet-based communications affect your work-related interpersonal relationships? a. Loss of communication b.
2AA	31	In what ways, if any, did the loss event affect your work community connections?
2AB	3	Is there anything else you would like to add?
2B	----	In what ways did the loss and restoration of the Division's Internet-based communications affect your work-related interpersonal relationships? c. Restoration of communication d.
2BB	0	Is there anything else you would like to add?

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Code Word	Number of Coded Segments	Interview Question and Related Probes
3A	----	In what ways did the loss and restoration of the Division's Internet-based communications affect your personal work process? a. Loss of communication
3AA	28	What do you do to create, sustain, share, or renew knowledge?
3AB and 3AB1	96	What did you do differently to "make do" in this situation?
3AC1	71	What frustrations did you encounter and how did you address them?
3AC2	28	What frustrations did you encounter and how did you address them?
3AD	4	Is there anything else you would like to add?
3B	----	In what ways did the loss and restoration of the Division's Internet-based communications affect your personal work process? b. Restoration of communication
3BA	9	What do you do to create, sustain, share, or renew knowledge?
3BB	6	What did you do differently to "make do" in this situation?
3BC1	10	What frustrations did you encounter and how did you address them?
3BC2	1	What frustrations did you encounter and how did you address them?
3BD	1	Is there anything else you would like to add?
4A	----	In what ways did the loss and restoration of the Division's Internet-based communications affect your personal results? a. Loss of communication
4AA	8	Did the loss affect your view of who is your customer?
4AB	17	In what ways did or do you measure your results?
4AC	15	Did the loss have any affect on the performance feedback you give or receive?
4AD	1	Is there anything else you would like to add?

Code Word	Number of Coded Segments	Interview Question and Related Probes
4B	-----	In what ways did the loss and restoration of the Division's Internet-based communications affect your personal results? b. Restoration of communication
4BA	2	Did the loss affect your view of who is your customer?
4BB	5	In what ways did or do you measure your results?
4BC	4	Did the loss have any affect on the performance feedback you give or receive?
4BD	0	Is there anything else you would like to add?
5A	-----	In what ways do you believe that the loss and restoration of the Division's Internet-based communications affected the Division's results? a. Loss of communication
5AA	35	In what ways was your working with others affected by the loss?
5AB	15	Did you see this situation as affecting the organizational system?
5AC	39	Did the loss have any affect on the performance feedback you give or receive?
5AD	2	Is there anything else you would like to add?
5B	-----	In what ways do you believe that the loss and restoration of the Division's Internet-based communications affected the Division's results? b. Restoration of communication
5BA	6	In what ways was your working with others affected by the loss?
5BB	4	Did you see this situation as affecting the organizational system?
5BC	10	Did the loss have any affect on the performance feedback you give or receive?
5BD	0	Is there anything else you would like to add?
6	-----	In what ways, if any, do you understand these loss and restoration events to have any meaningful impact on organizations, in general, or society, as a whole?
6A	5	- Terrorism, such as Pentagon and World Trade Center - Natural disasters, such as the Texas floods or California earthquake - Wars, such as in Afghanistan
6B	3	Highly integrated systems, such as Department of Interior or an ERP
6D	28	Is there anything else you would like to add?

Table 6. Explanation of Code Words Added During the Coding Process

Code Word	Number of Coded Segments	Meaning of Code Word (This Code Word was assigned when the participant said something about...)
ACCESS	22	his having access to others or their access to him.
COHESIVNS	17	SBM's cohesiveness or lack thereof.
COMPLEX	3	organizational complexity.
CONTROL	3	The ability of SBM people to control their own work, work processes, et al.
* ECLECTIC	1	the nature of SBM's work and, therefore, its variety.
FAIL	30	the failure of management to provide the tools to get work accomplished.
FLEXIBLE	6	the nature of the SBM organization, as flexible.
GOALS	4	ABM's or SBM's goals.
GOODTHG	18	the benefits that accrued from the communications loss and restoration.
IDENTITY	13	the nature of the SBM organization and the ways in which people understood it.
IM	4	instant messaging as a work place tool.
INDVDLPM	6	The nature of the SBM organization, as a group of individual program managers doing their own work reasonably independently (connected to Eclectic).
LACKCOMM	13	The lack of communication from management about the communications loss and the restoration plans
* LRND	2	Learning something from this experience.
* MISSION	2	ABM's or SBM's mission.
* ORGMATTERS	1	organizational matters.
* ORGNAT	1	organizational nature.
* ORGREL	1	organizational relationships.

PHYSICAL	22	the physical workspace.
* PURPOSE	5	ABM's or SBM's purpose.
* SPVSN	4	supervision or lack thereof in the SBM organization.
* STAFFING	1	staffing of SBM's leadership position.
STANDUP	6	the daily, first-thing-in-the-morning, short Staff Meeting. They were called "stand ups" because everyone stood up in order to keep the meetings short.
TRUST	10	trust in one another or the organization.
* VIRTORG	4	virtual organizations.
* WALK	5	walking around, as a management technique.
WARN	5	being warned or knowing that SBM would lose its Internet connection.
WORKDONE	74	having to get work accomplished in face of circumstances.

Notes:

- * These Code Words and their related coded segments were
 1. combined with others because of their similarities. For example, MISSION and PURPOSE would be combined with GOALS (Guba & Lincoln, 1985, p. 309).
 2. not used in the analysis, per se, because there were too few instances to make much of an impact. Their source was, generally, only one person (Guba & Lincoln, 1985, p. 304).

APPENDIX J. INTERVIEW DATA

This Appendix J contains three tables, which provide insights into the interview data.

The first table, "Sorted by Length of Interview Time," shows the Participant, the work cluster or clusters with which the individual is associated, and the time in minutes and seconds that the interview lasted. The other two tables are sorted by the work clusters to which the individuals belong.

Table 7. Interview Data Sorted by Length of Interview Time

Interview Data			
Sorted by Length of Interview Time			
Participant	Work Cluster		Time (Min.Sec)
	1	2	
D	Front Office Admin	Three Admin	3.16
C	Front Office Admin	Three Admin	6.22
P	All SBM People	Three Admin	9.39
A	Front Office Leaders	Three Leaders	20.07
G	Help Desk		22.52
J	All SBM People		23.01
I	All SBM People		23.51
L	All SBM People		26.53
Q	All SBM People		28.48
K	All SBM People	Three Leaders	36.13
M	All SBM People		40.27
R	All SBM People		41.33
F	Help Desk		41.38
E	Help Desk		44.20
H	All SBM People		46.13

Table 8. Interview Data Sorted by Work Cluster 1 Membership

Participant	Work Cluster		Time (Min.Sec)
	1	2	
B	Front Office Leaders	Three Leaders	46.31
N	All SBM People		46.53
O	All SBM People		47.16
Sorted by Work Cluster 1 Membership			
P	All SBM People	Three Admin	9.39
J	All SBM People		23.01
I	All SBM People		23.51
L	All SBM People		26.53
Q	All SBM People		28.48
K	All SBM People	Three Leaders	36.13
M	All SBM People		40.27
R	All SBM People		41.33
H	All SBM People		46.13
N	All SBM People		46.53
O	All SBM People		47.16
D	Front Office Admin	Three Admin	3.16
C	Front Office Admin	Three Admin	6.22
A	Front Office Leaders	Three Leaders	20.07
B	Front Office Leaders	Three Leaders	46.31
G	Help Desk		22.52
F	Help Desk		41.38
E	Help Desk		44.20

Table 9. Interview Data Sorted by Work Cluster 2 Membership and Time.

Sorted by Work Cluster 2 Membership and Time			
Participant	Work Cluster		Time (Min.Sec)
	1	2	
D	Front Office	Three	3.16
	Admin	Admin	
C	Front Office	Three	6.22
	Admin	Admin	
P	All SBM People	Admin	9.39
	Front Office	Three	
A	Leaders	Leaders	20.07
		Three	
K	All SBM People	Leaders	36.13
	Front Office	Three	
B	Leaders	Leaders	46.31
G	Help Desk		22.52
J	All SBM People		23.01
I	All SBM People		23.51
L	All SBM People		26.53
Q	All SBM People		28.48
M	All SBM People		40.27
R	All SBM People		41.33
F	Help Desk		41.38
E	Help Desk		44.20
H	All SBM People		46.13
N	All SBM People		46.53
O	All SBM People		47.16