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The benefits of electronic communication among library professionals

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Neufeld, Kenley E., M.L.S.

San Jose State University, 1994

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**THE BENEFITS OF ELECTRONIC COMMUNICATION
AMONG LIBRARY PROFESSIONALS**

A Thesis

**Presented to
The Faculty of the School of Library and Information Science
San Jose State University**

**In Partial Fulfillment
of the Requirements for the Degree
Master of Library Science**

By

Kenley Neufeld

August, 1994

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ABSTRACT

THE BENEFITS OF ELECTRONIC COMMUNICATION AMONG LIBRARY PROFESSIONALS

By Kenley Neufeld

This thesis discusses the benefits of electronic communication among library professionals. It examines those benefits as they relate to the level of the user of electronic communication (e-mail). Furthermore, the study examines the characteristics of the respondents at each of the user levels. An electronic questionnaire was used to gather the data from information professionals from around the world. The research shows a trend in which the user of electronic communication experiences a greater number of benefits as the user becomes more advanced in the use of e-mail. The study hopes to provide evidence to support the further encouragement and development of electronic communication systems among library professionals.

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CHAPTER 1

Introduction

The past twenty-five years have seen an incredible increase in the use of computer mediated communication systems. Initially, only a trickle of these systems were in use, mainly in large research oriented organizations; currently these systems have expanded into virtually every type of organization and institution. It would be very unlikely for a person to walk into a college or university anywhere in the world and not find some sort of computer mediated communication system. The last five years have witnessed exponential growth in this area due particularly to the widespread use of, and interest in, what is known as the Internet.

Background

The Internet, and specifically electronic mail, or e-mail, is becoming a vital and encompassing force within the library profession. The way in which the profession communicates may be forever changed due to this new form of communication. A librarian normally has other librarians within his or her organization from whom to draw feedback and information. With the Internet, there is a world of librarians and

non-librarians from Australia to Sweden to across the United States from whom to fulfill these needs. The existence of e-mail may not be new to many librarians, what *is* new is the wider accessibility to electronic communication and the broader geographic area over which it is conveyed. This will have an impact on the library profession as well as the library professional. What the library professional *perceives* as the benefits of e-mail on his/her professionalism and on the library profession is the primary question to be studied.

In 1969, the Department of Defense established a testbed to evaluate the use of a wide area network (WAN) for sharing research information. This testbed connected four universities¹ and became known as Advanced Research Projects Agency Network (ARPANET). Many of the rules, or protocols, established by this first wide area network also provided the framework for most of the computer based communication that occurs today. Despite the fact that this testbed connected university sites, this early wide area network was only used by those associated with the Department of Defense. In 1981, the City University of New York (CUNY) created what became known as BITNET (Because It's Time Network) to facilitate communication within the

¹ University of California, Los Angeles, University of California, Berkeley, Stanford University and University of Utah.

academic community. BITNET now includes thousands of sites around the world and its primary use has been electronic discussion groups facilitated by software known as listservs.

In the mid 1980's a change began which ultimately developed into what is collectively known as the Internet. The National Science Foundation (NSF) is a U.S. government agency whose purpose is to promote the advancement of science. In 1985, this organization connected five supercomputers around the country with a high speed communications network. This high speed hierarchical network, known as the NSF backbone, facilitates the fast flow of information and research across the country. Today, the NSF backbone is comprised of sixteen computers at its highest level. One of the reasons we have witnessed the exponential growth of the Internet is because of the NSF backbone. The Internet is essentially a network of networks that encompasses roughly 400 to 500 other networks throughout the world, the NSF backbone being the most significant in the United States.

The rise of the Internet and one of its major features, electronic mail, have changed the way librarians utilize electronic media. Librarians have been users of electronic or computer media since the time of the ARPANET in the late 1960's and early 1970's. The initial medium had been online databases provided by vendors such as DIALOG and ORBIT.

These vendors provided online access to indexes normally provided in print. It was not until the late 1970's and early 1980's that the computer became a communication medium. In the late 1970's and early 1980's the use of local area networks (LAN) in universities and large organizations became commonplace for intra-organization communication. And, with the beginnings of BITNET, a wider area network was created for librarians to communicate with others around the country and the world. By the end of the 1980's, local area networks, BITNET and NSF had become increasingly interconnected and collectively known as the Internet. Of all the features that the Internet provides, electronic communication via e-mail is by far the most significant.

The Research Problem

What the library professional *perceives* as the benefit of e-mail on his/her professionalism and on the library profession is the primary question to be studied. The benefits of electronic mail may well be different for different groups of people. The time required to study just one group of people, from the beginning of their usage to consistent or daily usage, is beyond the scope of this study. However, by breaking down the users of e-mail into three distinct groups and studying how

each group perceives the benefits of e-mail, we can come to an understanding of what the benefits are for different groups of users within the information profession. The definitions of these groups will be introduced later. The hypothesis is that the advanced users of e-mail will perceive greater benefits for the individual, the profession and the client than beginning users.

In this study, electronic mail is defined as messages sent from one computer user to another via the Internet or a local area network (LAN). The message can be sent from one computer user to a specific individual or the message can be sent to multiple computer users. In defining e-mail in this way, any electronic discussion group such as those on a listserv or a Bulletin Board System (BBS) will be included.

Electronic communication is important to study for several reasons. A study conducted by Abbott (1991) found that "e-mail is a valuable tool for generating ideas, brainstorming, assessing mutual problems, and planning and evaluating programs" (p 63). With this in mind, we can suggest that the use of e-mail by a librarian is beneficial to his/her individual professionalism as well as beneficial to the institution he/she may be a part of. By encouraging the use of e-mail, we may improve as individual library professionals, through greater access to our colleagues, as well as improve the library professionals which will

ultimately improve the services we provide our patrons. In conducting this study, we will better understand the users and the benefits of e-mail which in turn will encourage further development in utilizing computer mediated communication systems for group work.

Another reason for the undertaking of this study is that the existence of communication requires further study itself. As reported by Hiltz (1984), "studies have shown that the most frequent thing that office workers do is communicate information ... estimates of the amount of time a knowledge worker spends in the communication activity range from 50% to 90%" (p 4). What better forum to adapt than that of electronic communication? Many work stations already have a computer, the essential element to supporting this electronic communication. Through studying those individuals who already use e-mail and by reviewing the perceived benefits of that use, we can support the development of better electronic communication systems as well as the training involved with that use.

Based on a survey of special librarians, the primary use of the Internet is work-related electronic mail (93%) (Ladner & Tillman, 1991). Since the study only dealt with special librarians, some understanding of other types of librarians and their electronic communication is necessary. As a form of communication, what impact does electronic

mail have on the profession in general? More specifically, does it draw the library community together into a more cohesive unit? The ability of academic, public and special librarians to communicate and interact via the same medium may diminish some of the boundaries that have been established between these various sectors of the profession. An opportunity for more direct interaction may be beneficial to the profession as a whole. By assessing the benefits of electronic mail among all types of librarians, we will understand these questions.

Other questions which deserve attention have to do with the individual librarian. Does e-mail *broaden* the professional's knowledge base through communication with librarians and/or non-librarians outside one's particular specialty? Or, does e-mail *narrow* one's subject base because of the ability to communicate with a very *specific* group of people via specific discussion groups? How do librarians communicate with each other? Before the advent of computer mediated communication systems, did librarians have any type of a broad base of individuals from which to seek feedback and information, as e-mail now offers them? These are some of the questions this study will attempt to answer. The above questions will be answered indirectly by presenting the answers as suggested benefits of electronic communication rather than specific questions on the questionnaire.

The independent variable in the study to be conducted will be the various levels of experience for e-mail users among the library profession. A user of e-mail will fall along a continuum from those who are new users or *beginners* to those who are heavy users or *experienced*. The basis for the user level will be a combination of the length of time the subject has used e-mail and the length of time the subject has used the Internet. Therefore, I expect to find that as a librarian becomes more accustomed to electronic communication and moves along this continuum, there will be more perceived benefits for the librarian.

CHAPTER 2

Literature Review

Introduction

In the last three years there has been a proliferation of literature on the subject of the Internet. Most of what can be found is merely historical, descriptive and/or practical in nature. If you want to know how the Internet began or how the Internet actually "*works*," there is no shortage of valuable articles and surveys (Corbin, 1991; Rosenbaum & Newby, 1990; Lynch & Preston, 1990; Britten, 1990). Electronic mail via the Internet has many practical uses that have also been well covered in the library literature with subjects ranging from document delivery and reference services to listservs and discussion groups (Ladner & Tillman, 1993; Denton, 1992; Jackson, 1993; McKinzie & Kovacs, 1991). What about the research literature relating to the library profession, particularly as it relates to electronic communication?

Library literature is lacking in research relating to Internet usage and the electronic mail feature as an emerging form of communication. Most of the research relating to computer mediated communication systems comes from the computer science, information science, management science and communication fields. Furthermore, most of

the research conducted in these fields was done in the early to mid 1980's. Two of the early literature reviews present important documentation. An early review by Rice (1980) discusses the literature on the impacts of computer mediated organizational and interpersonal communication. A general review relating to computer mediated communication systems is presented by Steinfield (1986) and generally covers the information since the Rice review in 1980. These two literature reviews cover thoroughly the period through the mid-1980's.

The most recent literature review is by Metz (1994). Both his review and argument suggest that there is no continuity in the existing literature and that the research has "scrambled along behind the technology and the culture with no theoretical base to guide it" (p 2). According to Metz, certain topics have been studied too much, for example, electronic communication within an organization and computer conferencing. Other topics have not been covered at all, for example, computerized bulletin boards (BBS), Internet Relay Chats (IRC) and Multiple User Dungeons (MUD). Certainly there is a wide field to cover when it comes to computer mediated communication. In addition, it is a relatively new phenomena. Due to the wide variety of topics and apparent social implications, computer mediated communication deserves to be a specialized field of study. This brings us to the problem

of having little or no research conducted in the library profession concerning this form of communication.

Despite the fact that there is little research, there are several studies concerning librarians as related to (1) how librarians communicate in general (Whitehall, Durbidge & Meadows, 1989), (2) e-mail usage and availability in two-year colleges (Abbott, 1991), and most significantly, (3) the use of the Internet by special librarians (Ladner & Tillman, 1991). These three studies are valuable to the current topic of discussion because they provide a background and justification for further research. In general, they present surveys conducted with various members of the profession. Two of the studies suggest that e-mail is widely used among certain library professionals but they do not seek to answer the question regarding its *benefits* or *impact*. Since each of these studies focuses on specific groups within the library profession, more research must be done on the profession as a whole to determine if these findings can be generalized to the entire profession and whether or not any benefits are perceived.

A study by Schaefermeyer and Sewell (1988) surveyed the amount of e-mail use and the purpose of that use within an organization. This study used an open ended questionnaire to ask users what they perceived as the advantages and disadvantages of electronic

communication, as well as how it may change interpersonal communications. The users were drawn from three non-library related listservs on BITNET, creating an interdisciplinary sample. This was the only study to try and determine any perceived advantages and/or disadvantages of electronic communication. The presentation of the study's findings is limited but the ideas and arguments are beneficial for soliciting further research.

Based on the fact that e-mail is used in an organization, other than a library, Hiltz and Johnson (1989) and Hiltz (1984) both surveyed user acceptance, user satisfaction and user reaction to computer mediated communication systems. Their research included direct study of computer messages and questionnaires given to a small group of scientists. Gluck, Coliz and Rosenbaum (1991) investigated, through experimental research, the differences in messaging depending on the system used. Specifically, it sought to discover the difference between using e-mail versus voice mail and why one was chosen over the other.

There have been several empirical studies of electronic mail systems as they relate to socio-emotional interaction and to social norms on the networks (Love & Rice, 1985; Rosenbaum & Snyder, 1991; Freeman, 1984; Rice, Chang & Torobin, 1992; Sproull & Kiesler, 1986). Each presents arguments which suggest that e-mail interaction is more

than merely a forum for task oriented information. In fact, as much as 30% of the communication is characterized as "social" in nature. Freeman in particular looks at the development of social networks among a group of scientists through the use of computer mediated communication. Rice, Torobin and Chang introduce concepts relating to communication style and level within an organization as factors in adopting and using electronic communication. The principle behind the Sproull and Kiesler study was to discover whether electronic communication creates new information within an organization and whether it changes who has what information. However, the study ultimately discusses and explores the social queuing system as it relates to e-mail rather than what was proposed in the hypothesis. Each of these studies is thorough and uses content analysis to study patterns of electronic communication.

In the following sections the details concerning the methodologies and variables of these studies will be discussed in greater detail. Following a brief discussion of the library related research, we will look at investigations concerned directly with computer mediated communication rather than with the background studies that focus on how the Internet is being used. The primary interest here is working forward from the background study to the studies on the impact of

computer mediated communication. As a result of this review, we will have a better understanding of the important aspects of the literature as well as possibilities for further research. Specifically, do the results of these studies warrant further investigation by the librarian researcher? The methodologies utilized in these studies falls into three categories: (1) questionnaire only, (2) questionnaire and/or content analysis, and (3) experimental. The type of methodology used by the individual studies will be the framework for the discussion of the computer mediated communication studies.

Library Related Research: Communication, E-Mail and the Internet

Whitehall, Durbidge and Meadows (1989) sought to study how librarians communicate. Who do librarians communicate with, what channels do they use, and finally, how frequently do they communicate? The methodology utilized in the study was a questionnaire distributed to employees of the British Library, members of three academic libraries, members of public libraries and members of an unspecified number of special libraries. There was no random selection or any attempt to collect an unbiased group of subjects. The independent variables were the type of library the subject came from and the job level within that organization. Despite the lack of randomness and the fact that it only

covered librarians in England, the results of this survey provide insight into some valuable trends. The findings suggest (1) a web of horizontal information flow exists across the organization structure, (2) information is sought primarily face to face, (3) discussions with external contacts most frequently employ the telephone with an increasing interest in electronic mail or fax, and (4) librarians usually communicate with librarians within their own group (i.e. - academic to academic, public to public). The results found in this study are important because changes may be occurring with the greater use of e-mail, resulting in a very different picture.

Abbott (1991) surveyed the use of e-mail in two year college libraries. He sought to "collect limited demographic information about two year college libraries, the availability of e-mail systems, and attitudes about expanded use of e-mail for inter-library communication" (p 59). Since he received only a 20% response rate (twenty out of one hundred randomly selected members of ALA's Community and Junior College Libraries Section), the results were presented as trends rather than statistically tested results. Abbott found that only half of the respondents even had access to e-mail and only a third of those regularly used it to communicate outside their institution. The primary reason suggested for such a low percentage is the cost associated with

implementing an Internet connection. Despite these findings, the researcher found e-mail to be a "valuable tool for generating ideas, brainstorming, assessing mutual problems, and planning and evaluating programs" (p 63). I would suggest that the findings of this study would be significantly different if it were to be conducted in 1994. In just three years, the whole topography of the Internet and its use has changed significantly. Early studies such as this will provide valuable information for future researchers.

Another study conducted in 1991 on special librarians found very different results from those in the Abbott study. Ladner and Tillman (1991) surveyed a total of fifty-four special librarians. The sample was solicited through a "Call for Participation" announcement posted on nine computer conferences and through a similar announcement in the monthly newsletter of the Special Libraries Association. Like the Abbott study, the survey did not attempt any kind of probability sampling. The most significant result found in this survey was that 93% of the respondents stated that they used the Internet for work related communication/e-mail. The value of e-mail was stressed over and over by the respondents. Many of the benefits suggested in this study were utilized in the questionnaire of the study at hand. Despite the lack of statistical testing, the study does provide a solid framework of how one

group of librarians utilized the Internet and how they perceived the benefits. Because of the results found in this study, further research can be encouraged and conducted concerning electronic communication among librarians.

Studies in Computer Mediated Communication

Of the primary studies mentioned, questionnaires were the only source of information in Freeman (1984) and Schaefermeyer and Sewell (1988). The overall aim of Freeman was to "determine the impact, if any, of using a computer to facilitate communication among some of the members of an emerging specialty in science" (p 201). Freeman surveyed a group of social scientists at three seven-month intervals. There was no electronic communication in the first survey but in the following two, a computer conferencing system had been installed in the organization. Out of a total of 104 respondents, sixteen had completed all three surveys. The independent variable was the addition of a computer conferencing system to a group of social scientists. The dependent variables are the (1) familiarity level of two or more scientists and (2) the number of other scientists the subject is familiar with. For example, how well do two social scientists *know* each other? Or, did the addition of a computer conferencing system effect the level of familiarity as well as the

number of other scientists the subject knew? Since this particular study dealt with a small number of people, the results are only suggestions. However, a trend certainly exists where the level of familiarity and the number of acquaintances did increase with the addition of computer conferencing. This study also provides a stepping stone to further research.

Schaefermeyer and Sewell (1988) conducted an electronic survey on three BITNET listservs. The survey focused on the "amount and purposes of using e-mail within the context of the BITNET system" (p 116). The results are presented in a purely descriptive format with no statistical testing. The variables include (1) whom the user contacts, (2) how the user uses e-mail, (3) the advantages of e-mail, and (4) the disadvantages of e-mail. Unfortunately, the researcher does not mention the number of people surveyed nor the percentage who responded. Because there are no real numbers associated with this study, the results presented cannot be taken too seriously. Despite this problem, the researcher did suggest, in a very general way, how much, and in what way, users of the BITNET system were using electronic communication.

Content analysis is one of the primary measures in studying user socialization on the networks; six of the studies utilized this method for a

variety of purposes. The primary sources of data in these studies were the messages sent and received on conferences, listservs or electronic bulletin boards. The aim of each study was the development of norms, the development of social interaction over the networks and user satisfaction. A multitude of variables must be considered when conducting this type of research. In the studies using content analysis and/or questionnaires, many of the variables went unaddressed and therefore the results of those studies cannot be generalized.

Direct observation and surveys seem to be the only way to gain valid information about how professionals are interacting with computer mediated communication systems. The type of information sought by these researchers is generally broad and hard to define, therefore, observation over a period of time allows the researcher to see the changes over a long period of time and draw conclusions accordingly. However, a study conducted over a long period of time can be detrimental to your study. The longer the period of time that a case study is conducted, the more valid it may be due to the increased awareness of the study group but the less control the researcher will have due to possible changes within that study group.

Hiltz (1984) is an example of one researcher who utilized content analysis as well as a questionnaire. The study was conducted over a two

year period on a group of scientists and engineers in which the exchange of ideas was vital to research. During the course of two years there were changes within the research community, such as turnover of users, that may have skewed the results. Despite the difficulties associated with user turnover, the results of this study, and the consequent book and articles, have provided a solid foundation for much of the research in computer mediated communication. According to the author, the independent variables in this study were (1) the characteristics of the individual users, (2) the scientific user groups, (3) the tasks undertaken on the system, and (4) the system itself. Hiltz wished to observe the impact of electronic communication on a group of scientists. What the impacts were became her dependent variables. The two major impacts observed were (a) changes in communication and cohesion among the scientific community and (b) clarification of theoretical and methodological controversies.

A second study by Hiltz, in collaboration with Kenneth Johnson, was completed in 1989. This study sought to determine the acceptance level and success of electronic communication. Four independent variables were identified: (1) the interface, (2) the system's performance as productive and stimulating, (3) ability of computer mediated communication systems (CMCS) to support expressive interpersonal

communications, and (4) problems with CMCS as a mode of communication and information exchange. The study observed four groups of users on different systems. The response rate was between 40% and 56%, depending on the group. The information gathered from the questionnaire was statistically tested to determine validity and the results support findings in earlier studies. Examples of benefits found in this study include productivity enhancement and individual career enhancement through increased personal networking.

Rice, Torobin and Chang (1992) suggested that "regardless of what researchers, social critics, and ordinary folk think about CMC during its introduction into organizations and society, people with varying communicator styles will come to use this medium for a wide variety of purposes and accept it as just one of many possibilities for communicating" (p 28). In their study of two different user groups, a government site and a private research and development site, Rice et al. tested the hypothesis that communicator style would affect the adoption, usage and evaluation of computer mediated communication system. Their response rate was significant and their findings statistically tested to show that communicator style had little influence. This hypothesis was tested on the individual sites as well as on both sites together with similar findings.

Sproull and Kiesler (1986) continued the trend of studying the use of e-mail within the framework of an organization. Like Hiltz, the Sproull and Kiesler studies are at the forefront of the computer mediated communications research. In this particular study, Sproull and Kiesler used "questionnaire data and actual messages to examine electronic mail communication at all levels of the organization" (a Fortune 500 company)(p 1492). Specifically, they hypothesized: (1) that social context cues are relatively weak in electronic mail, (2) that electronic mail system behavior is relatively self-absorbed, (3) that the users are relatively undifferentiated by status, (4) that the users are relatively uninhibited and nonconforming, and (5) that electronic mail systems provide new information, not just a faster way to receive old information. Their sample consisted of 98 people out of 513 total. Their independent variables (employment level and gender) broke the sample into six groupings. Using three different methods - interview, questionnaire and content analysis - the researchers found evidence that supported their hypothesis. The study followed standard statistical analysis but could not generalize the results due to the fact that the study occurred within one organization. The researchers suggest the value of a study that uses data similar to that collected in this study to be compared with data collected in studies of actual face to face conversations or telephone

communication.

One study used content analysis as the only method for data collection and research. Love and Rice (1985) "analyzed six weeks worth of transcripts from a computerized bulletin board of a nationwide public computer conference system" (p 266). Their total sample was 388 messages sent by 112 different people. All the sentences from the messages were coded and placed in one of fourteen categories. The most significant of the dependent variables were: a) subject asking for information or subject providing information and b) subject discussing personal information or non-personal information. The 112 people were placed in one of three groups based on a network analysis program. The actual process and group selection is not clear and raises questions as to the validity of the study. The study found support for half its hypotheses: (1) the user's sociability will be reflected in both the duration and frequency of messaging, (2) the amount of socio-emotional content on a computer mediated communication system will increase over time, and (3) socio-emotional comments will comprise a moderate amount of the message content. Further study and analysis would be necessary to generalize this evidence due to the nature of the sample population and the methodology used.

Another study utilizing content analysis, as well as a case study,

was conducted by Rosenbaum and Snyder (1991). The case study was used to illustrate an example of emerging norms in computer mediated communications. The study was primarily interested in emerging norms and utilized content analysis to "determine the structural- and content-characteristics of messages" posted to several ongoing BITNET discussion groups (p 15). In all, 622 messages from a three month period were analyzed. The content analysis was based on thirty-six separate characteristics which placed a message into either the structural-related category or the content-related category. The coding of messages was conducted by two individuals and their results compared for accuracy. The researchers' findings suggest that (1) users tend to discuss only one topic per message, (2) users tend to personalize their messages, (3) users tend to discuss topics without explicitly referring to earlier messages and finally, (4) despite the fact that participants were able to post a message on any subject at all, most kept their postings within the stated purpose of the conference. These findings must be taken within the context of computerized conferencing and not necessarily personal correspondence.

The one exception in all the studies presented here is Gluck, Coliz and Rosenbaum (1991) which compares e-mail with voice mail. They conducted a strictly experimental study in a laboratory setting to determine which of the mediums would be used, given a hypothetical

situation. By placing the same conditions on a situation and providing a choice of medium, Gluck, Coliz and Rosenbaum were able to observe a difference between e-mail and voice mail. What we know as a result of their study is that e-mail is slower than voice mail but is more accurate when applied to specific tasks, based on the performance of the subjects. Some of the subjects preferred neither of the mediums in some instances because of the lack of direct feedback. What could be developed further from this study is the question: How long does it take to receive a response to a given inquiry? Would voice mail really be faster than e-mail if you only had voice mail as a medium? Would you end up playing "phone tag" with the voice mail system, thus never directly transmitting the message or would you be able to receive a complete message through e-mail without ever directly interacting? The time lag leading to completion of a particular inquiry is valuable for comparison when selecting between e-mail and voice mail systems.

Conclusion

The wide variety of research into computer mediated communication is as varied as it is incomplete. A great deal of further research is necessary in the library and information science field to provide a solid understanding of the rapidly changing environment of

computer mediated communication. More and more the library professional will come to rely on e-mail as a basis for wide area communication between other professionals and clients. Despite the need for further study, the research that has already been completed does provide us with a stepping stone to understanding the phenomenon and to predict the trends and outcomes of future research.

CHAPTER 3

Methodology

Sample Description

The primary method of data collection was a written questionnaire. A sample was drawn from a group of library related listservs. *Listserv* is the software used to facilitate online discussions, hence the name listserv discussion groups. One of the features of the listserv software program is the ability to receive a list of all subscribers to a particular discussion. The alphabetical list of all the subscribers on four library related listservs were the starting sample. The four listservs -- LIBREF-L (Discussion of Reference Issues), BUSLIB-L (Business Librarians), SLAITE-L (Special Librarians) and CALIBK12 (K-12 Librarians in California) -- were selected in hopes of including a wide variety of information professionals in the field. There were 4,987 names gathered from these listservs. The sample for the study was drawn from this list of names and was based on systematic selection from a random start. In this case, a neutral third party was asked to select a number between one and twenty without knowing the purpose. The number twelve became the random start and every twelve name was selected. In all, 243 names were selected to be

participants in the study.

Prior to sending out the questionnaire to the entire sample population, a number of librarians familiar to the researcher completed the questionnaire. The purpose of this initial exercise was to clarify any problems with the questionnaire. No significant problems arose from this exercise. A personal e-mail message was sent to each of the names on the sample list asking for participation in the study. The subject's name was put in the subject line of the e-mail message in order to avoid the message from being deleted by the potential subject.

Questionnaire Design

During the course of the Spring semester of 1994, a questionnaire was developed with the input of the thesis committee and through the study of designs of other similar studies. The format of the questionnaire was a series of questions that asked the subject to select an answer from a range of predefined categories. The fifty questions were designed in such a way as to assist in (1) determining the characteristics of library professional e-mail users and (2) determine any perceived benefits to that use. See Appendix 1 for a complete copy of the questionnaire.

The first twenty-two questions of the survey sought to determine the characteristics of e-mail users among the library profession. These

twenty-two questions can be broken up into three categories. The first category sought to determine the level of the e-mail user by asking (1) how long the subject had been using e-mail, (2) how long the subject had been using the Internet, and (3) how many listservs did the subject subscribe to. The second category sought to determine the general communication patterns of the subjects. Specifically, how many other library professionals does the subject come in contact with and how often does that communication occur. As part of this category, questions pertaining to professional involvement were included since this type of involvement would include a certain amount of professional communication. The final category in the first section pertains to specific communication habits. Specifically, what types of communication mediums are used and how often. All major forms of communication were included in this section (telephone, FAX, regular mail, e-mail and in person).

The remaining twenty-eight questions pertain to how the subject perceives the use of e-mail as beneficial. The benefits included in the questionnaire were drawn from benefits found in other studies and in benefits from personal experience with e-mail. The survey asked the subject to select all those benefits that apply by placing an "X" next to the benefit. Ample space, and encouragement, for the subject to include

any benefits not listed as a choice were also provided. Since the list of benefits was so long, the list was broken into five general categories. The five categories were: *Benefits of Time and Distance*, *Benefits for the Professional*, *Benefits of Quality*, *Personal Benefits* and *Other Benefits*. This list of benefits was not meant to be all inclusive but is a list of what can be found in the literature. Part of the purpose of the pre-test was to determine whether this list reflects the reality of the situation and then to change the list of benefits accordingly.

Based on the responses given in the first category of section one, the subjects were placed in one of three groups. Specifically, the questions pertaining to length of e-mail use and length of Internet use were used. Initially it was thought that length of e-mail use and Internet use would be essentially equivalent. However, slight variations occurred between the two lengths of use and therefore one response had to be given precedence over the other. Since the study at hand is interested in a wider use of electronic communication than just in-house e-mail communication, length of Internet use was given greater value in determining the subjects' level of use. The three user groups and their characteristics include:

Beginner (new user)

* 1 - 12 months of *Internet* use

Intermediate

* 13 - 36 months of *Internet* use

Advanced

* more than 37 months of *Internet* use

The list of benefits from an experienced or advanced e-mail user was expected to be richer than that of a beginning e-mail user. The number of perceived benefits would also depend on the level of the user.

Data Analysis

The type of research conducted in this study is of a descriptive nature. No attempt to statistically test the data was made. The data gathered from the questionnaire falls into three categories from which it can be analyzed. First, the level of the user is defined based on the questions answered in the questionnaire as explained above. Second, a discussion follows of the characteristics of e-mail users among library professionals. Third, the perceived benefits are charted in relation to each of the user levels. This descriptive analysis of the differences between user levels is necessary in order to understand any differences between the number of benefits associated with each user level. The next chapter reports the data collection and data analysis of the study.

CHAPTER 4

Results and Discussion

Introduction of the Sample Population

The purpose of this study was to determine if there was a relationship between the level of user and the number and range of perceived benefits of electronic communication. The respondents to the questionnaire were randomly selected from four library related listservs. These listservs included LIBREF-L, BUSLIB-L, SLAITE-L and CALIBK12-L. It was hoped to collect respondents from a wide range of libraries and information professionals. The questions of the survey were designed to allow the researcher to categorize each respondent and then draw a correlation between that category and the number of benefits selected. All personal information, beyond whether or not the respondent is a librarian or information professional, is irrelevant to the study. The study is merely interested in the level of the e-mail user and the number of benefits associated with that user's level.

The sample population in this study consisted of 243 individuals derived from the above mentioned listservs. They were randomly selected from the over 5,000 names subscribed to these discussion groups. Of these 243 individuals, thirty-two questionnaires were returned with the

first e-mailing and an additional twenty-five were collected from a second e-mailing. In all, fifty-seven questionnaires, or 24% of the sample population, were returned.

Of the fifty-seven questionnaires returned, eleven of the respondents were eliminated from the final calculations. Since the study sought library professionals currently working in the library profession, library students who received the questionnaire were ineligible to participate. Six respondents returned the survey stating they were library students and either stated they did not think they were eligible or inquired about their eligibility. Four of the respondents returned the survey stating that there was not enough time for them to complete the questionnaire. One person responded too late to be included in the calculations but expressed a desire to be included. The final number of respondents used in the calculations was forty-six or 20% of the total sample population.

The forty-six respondents used in the study all considered themselves library or information professionals. The range of libraries included colleges and universities, commercial companies, non-profit organizations and public libraries. The most significant group was the college and university group which provided 63% of the returned questionnaires. The commercial companies and non-profit organizations

made up 15% and 17% , respectively. Four percent of the qualified respondents were from public libraries.¹

The respondents were placed in one of three categories. These categories are based on the responses given to two questions that asked the length of time the subject has used the Internet and the length of time the subject has used electronic mail. Since this study is focusing on electronic communication on a wider basis than merely within an organization, the response given to length of Internet use was given greater consideration than length of e-mail use. For the most part, the period of time given for both answers was the same. However, some respondents had been using e-mail for many years but had been using the Internet for only a year or two. The categories used include Beginners (0 - 12 months of Internet use), Intermediates (13 - 36 months of Internet use) and Advanced (more than 36 months of Internet use). Of the forty-six respondents, sixteen are in the Beginner category (35%), thirteen are in the Intermediate category (28%) and seventeen are in the Advanced category (37%). This breakdown gives each group a fairly equal incidence.

¹See Appendix 2 for a complete listing of the range of libraries.

Characteristics of the Sample Population

Due to the low response to the survey, the information gathered from the questions cannot be generalized to the whole population. However, through a discussion of the responses, certain trends and observations may be made concerning the use and benefits of electronic communication among library professionals. In the following sections, the results of the questionnaire will be presented in descriptive and tabular form.

The first two questions were composed to determine the number of other professionals with whom the respondent came in contact within the place of work and outside the place of work. Table 1 illustrates the responses to the number of contacts within the place of work and Table 2 illustrates the responses to the number of contacts made outside the work place. As shown in the tables, most of the respondents stated that they had limited contact both internally *and* externally to the work place.

The results of Table 1 must be taken critically. The number of contacts within an organization will certainly vary according to the size of the institution. Therefore, the high percentage, 75% of the beginners users and 59% of the advanced users, showing one to seven contacts within their place of work, does not show a significant difference between the various levels of users. Additionally, the 31% of the

intermediate users selecting twenty or more contacts at their place of work may also be misleading due to the varying sizes of libraries.

Table 2 should have shown a difference between the beginning user and advanced user if the hypothesis proved correct. However, the majority of the respondents selected the response that stated they came in contact with no library professionals outside their place of work. Of all the respondents, only three (12% of the beginners and 6% of the advanced) marked that they came in contact with more than six library professionals outside their place of work. Seventy-seven percent of the intermediate respondents marked that they did not come in contact with any library professionals outside of work. The beginners and advanced marked none as their response on 44% and 41% of the questionnaires, respectively. The question may have been too ambiguous to receive a valid response. It is highly unlikely that 54% of all the respondents do not come in contact with any other library professionals.

TABLE 1 How many library professionals do you come in contact with each day at your place of work?

	1 - 7	8 - 10	11 - 19	20 +
Beginner	75%	13%	6%	-
Intermediate	38%	23%	8%	31%
Advanced	59%	18%	18%	-

(6% of the Beginners and 5% of the Advanced did not respond.)

TABLE 2 How many library professionals do you come in contact with each day outside your place of work?

	none	1 - 5	6 - 10	10 +
Beginner	44%	31%	6%	6%
Intermediate	77%	23%	-	-
Advanced	41%	47%	-	6%

(13% of the Beginners and 6% of the Advanced did not respond.)

The responses shown in Tables 1 and 2 become even more interesting when viewed in relation to Tables 3 and 4. Table 3 is an illustration of how often the respondents communicate with other library professionals within their place of work and Table 4 shows how often this communication occurs outside their place of work.

Table 3 shows that the majority of the respondents have fairly regular contact with other library professionals within their place of work. There does not appear to be a significant difference between the various levels of the user. The 13% of the beginners and 12% of the advanced users group that communicate "less than once day" can probably be attributed to those respondents who work within an organization that may only have one library professional. The same may be likely for the 13% of the beginners and 8% of the intermediates in the "once a day" category. Most of the respondents cluster around the "3-7 times per day" and "8-15 times per day" categories.

When the respondents were asked to mark the frequency of contact with professional librarians outside their place of work, the advanced users appear to have more frequent contact than both the beginner and the intermediate users. Table 4 shows the frequency of communication as well as the possible misinterpretation of question two regarding number contacts outside the place of work. In that question, 47% of the advanced respondents stated they had no contacts outside of their work but in the question relating to frequency, 35% stated they had "daily" contact and 35% stated they came in contact with other professional librarians outside their organization "3-7 times per day." Of those in the intermediate category, 76% selected "weekly" contact with only two respondents selecting more than weekly. The majority of the beginners selected "monthly" as their frequency of contact with 25% in the "weekly" category and 19% in the "daily" category. Table 4 does show that the more advanced e-mail user is more likely to have frequent contact with professional librarians outside their place of work. This suggests that librarians who utilize electronic mail as part of their work habit tend to have greater contact with librarians outside their work place. As a result, the librarian has a wider base of people from which to receive and provide information.

TABLE 3 How often do you communicate with other professional librarians within your organization?

	less than once a day	once a day	3 - 7 daily	8 - 15 daily	16 + daily
Beginner	13%	13%	25%	30%	13%
Intermediate	-	8%	38%	16%	38%
Advanced	12%	-	35%	29%	18%

(6% of the Beginners and 6% of the Advanced did not respond.)

TABLE 4 How often do you communicate with other professional librarians outside your organization?

	8 - 15 daily	3 - 7 daily	daily	weekly	monthly	yearly
Beginner	6%	6%	19%	25%	38%	-
Intermediate	8%	-	8%	76%	8%	-
Advanced	-	24%	35%	29%	12%	-

(6% of the Beginners did not respond.)

The next two questions in the survey had to do with the level of professional involvement of the respondent. Specifically, the survey sought to determine whether the respondent was involved in professional organizations and, secondly, if they participated on any state or national committees. Tables 5 and 6 illustrate the findings of these two questions. Table 5 shows that the overwhelming majority of all users participate in some type of professional organization. Despite the even percentages between the different user levels, the breakdown showing

the beginners with greater numbers (75%), versus 69% and 65% of the intermediates and advanced, participating in professional organizations is quite opposite to what this study expected. It appears that the beginners are more likely to be a part of a professional organization than the other two groups. Table 6, however, is more in line with what would be expected of the more advanced users. Where only 25% of the beginners are on a committee, nearly half (47%) of the advanced do participate in committee work. The intermediate level users are right in the middle with 38% on committees. Generally speaking, the users of electronic communication in this study appear to be fairly active in professional associations. The advanced users tend to participate more heavily in committee work than the other two groups.

TABLE 5 Do you actively participate in any state or national library organization, for example, American Library Association?

	Yes	No
Beginner	75%	19%
Intermediate	69%	31%
Advanced	65%	35%

(6% of the Beginners did not respond.)

TABLE 6 Are you on any committees at a state or national level?

	Yes	No
Beginner	25%	69%
Intermediate	38%	62%
Advanced	47%	53%

(6% of the Beginners did not respond.)

This study is focusing on the electronic communication among library and information professionals. Other media may be used by these professionals and the next question sought to determine what other types of media they used. The study hoped to show that the advanced user is more likely to use electronic communication over the other media options than the beginner or intermediate user. Tables 7 through 11 illustrate the use of five different forms of communication among the study's subjects. Not surprisingly, 100% of all subjects have used the telephone (Table 7) and 100% of all the subjects have used electronic mail (Table 9) in the past week. However, the use of the fax machine (Table 8), regular mail (Table 10) and in person communication (Table 11) varies slightly between the different user levels.

Table 8 shows the percentage of users who use a fax machine as a form of communication in the last week. There does not appear to be any trend in these findings. The beginners and the advanced users are almost equal with 69% of the beginners and 71% of the advanced saying

they have used the fax in the last week. The intermediate group is slightly lower with 46% responding yes to the question. When the question pertains to regular mail (Table 10), the curve suggests that almost all the beginners have used the mail in the last week (94%) where the advanced and intermediate users fall slightly to 82% and 85% respectively. Perhaps the advanced users found electronic communication more effective in some cases than did the beginning user. Table 11 presents some interesting results. Where 100% of the beginner group said they communicated "in person" at least once in the last week, one of the intermediates and two of the advanced respondents said they did not have any "in person" communication in the last week. If we are to accept these findings, then it appears that the beginning user is more likely to communicate in person or through the mail than the advanced user. We can infer that electronic communication takes precedent over other methods of communication among the advanced users.

TABLE 7 Used the telephone in the last week for professional or work related communication.

	Yes	No
Beginner	100%	-
Intermediate	100%	-
Advanced	100%	-

TABLE 8 Used a fax machine in the last week for professional or work related communication.

	Yes	No
Beginner	69%	31%
Intermediate	46%	54%
Advanced	71%	29%

TABLE 9 Used e-mail in the last week for professional or work related communication.

	Yes	No
Beginner	100%	-
Intermediate	100%	-
Advanced	100%	-

TABLE 10 Used regular mail in the last week for professional or work related communication.

	Yes	No
Beginner	94%	6%
Intermediate	85%	15%
Advanced	82%	18%

TABLE 11 Had in person professional or work related communication in the last week.

	Yes	No
Beginner	100%	-
Intermediate	92%	8%
Advanced	88%	12%

The respondents in this study were asked to state how often they used the various forms of communication. The frequency of use for each of the different media was expected to support the hypothesis that the more advanced users would utilize e-mail more frequently than the other media when compared to the beginner and intermediate groups. Tables 12 through 15 illustrate the frequency of use for the telephone, fax machine, e-mail and regular mail, respectively. Once again, it is not surprising to find that 100% of the respondents (see Table 12) use the telephone daily. The telephone has become such an integral part of business and society, one must use the telephone to conduct daily affairs.

The use of the fax machine for professional or work related communication appears to be the least when compared to other communication media. Of the forty-six respondents, the advanced users appear to utilize it more frequently than the other groups. Overall, the beginner category is evenly spread across the frequency chart with 25% reporting daily use, 31% reporting weekly use and 31% reporting monthly use (13% did not respond). None of the intermediate users reported using a fax machine daily and, when compared to the 46% reporting using the fax machine (see Table 8), it is not surprising. Of the 71% of advanced respondents reporting the use of the fax machine, 59%

report using it on a weekly basis and 35% report using it monthly. One of the advanced respondents reported use of the fax machine every day. The results found in Table 13 correlate with the findings found in Table 8. The group with the higher percentage of fax use, had a higher frequency of use.

Where Table 9 showed 100% of the respondents using electronic mail in the last week, the results found in Table 14 illustrate that the majority of the respondents also access e-mail daily. The study hoped to show that the advanced users would utilize e-mail more frequently than the other user groups. The advanced group does indeed use it more frequently but the difference is not significant, 94% advanced, 77% intermediate and 87% beginners use e-mail every day. What is surprising is that 15% of the intermediate group reported using mail only monthly and 8% reported weekly use. The study expected to find these numbers in the beginner category but only 13% of the beginners reported using e-mail less frequently than every day. Despite the slight variances, the majority of the respondents use e-mail every day.

Table 15 shows an even spread on the frequency of regular mail use among all the respondents. This corresponds with the results found in Table 10 which found that the majority of respondents used regular mail in the last week. Weekly use of regular mail was reported by 57% of

the beginners, 54% of the intermediate respondents and 53% of the advanced respondents. Daily use of regular mail follows the same pattern between groups with 31%, 23% and 29% reporting daily use, respectively. The beginners appear to use regular mail more frequently than the other groups but not at a significant level.

TABLE 12 How often do you use the telephone for communication?

	Daily	Weekly	Monthly
Beginner	100%	-	-
Intermediate	100%	-	-
Advanced	100%	-	-

TABLE 13 How often do you use the fax machine for communication?

	Daily	Weekly	Monthly
Beginner	25%	31%	31%
Intermediate	-	46%	54%
Advanced	6%	59%	35%

(13% of the Beginners did not respond.)

TABLE 14 How often do you use e-mail for communication?

	Daily	Weekly	Monthly
Beginner	87%	13%	-
Intermediate	77%	8%	15%
Advanced	94%	6%	-

TABLE 15 How often do you use regular mail for communication?

	Daily	Weekly	Monthly
Beginner	31%	57%	12%
Intermediate	23%	54%	23%
Advanced	29%	53%	12%

(6% of the Advanced did not respond.)

The majority of the respondents reported logging into their e-mail account more than once a day. The study predicted that the advanced users would log in more frequently than the other two groups. As Table 16 shows 100% of the advanced respondents logging into their e-mail account more than once a day compared with 69% of the intermediates and 75% of the beginners. Of the forty-six respondents, only two reported checking their mail less than once a day, one person each from the beginner and intermediate groups. Once again these findings are not significant but the trend suggests that the more advanced users check their mail more frequently than the other groups.

However, problems arise with this data when it is compared with the data illustrated in Table 14. In Table 14, 6% of the advanced respondents reported using e-mail weekly, whereas in Table 16, 100% reported logging into their e-mail account "more than once a day." A similar result is found when looking at the beginner category on both tables. In Table 14, 13% reported weekly use of e-mail where in Table

16, 19% reported checking their mail at least once a day. There is a discrepancy of 6% in the case of the beginners *and* the advanced users. This discrepancy may be the result of misunderstanding one or both of the questions.

TABLE 16 How often do you log on to your e-mail account?

	More than once a day	Once a day	Less than once a day	Less than once a week
Beginner	75%	19%	6%	-
Intermediate	69%	23%	8%	-
Advanced	100%	-	-	-

The hypothesis of the study suggested that those users who fall in the beginner or intermediate categories may not feel as though e-mail is *easily* accessible at their work place. When the respondents were asked this question, 100% of the advanced users felt as though e-mail was easily accessible at work. The curve follows the expected trend when 92% of the intermediates and 88% of the beginners stated that e-mail was easily accessible. The difference between the three categories is not that great but does suggest a pattern where the advanced users are more comfortable with e-mail than those found in the beginner or intermediate categories.

TABLE 17 Is e-mail easily accessible at your place of work?

	Yes	No
Beginner	88%	12%
Intermediate	92%	8%
Advanced	100%	-

The final question on the survey asked the respondents to state how many listservs or discussion groups they were subscribed to. In Table 18, the results of this question are illustrated to show a positive correlation between the level of the user and the number of listservs to which the respondent is subscribed. The categories the respondents are asked to select from are "less than two," "three to seven" and "more than seven." Only one respondent from each user group reported subscribing to fewer than two listservs. In the beginner group, 75% reported subscribing to three to seven groups and 19% subscribing to more than seven. In the intermediate group, 69% report three to seven groups and 23% report more than seven. Over half of the advanced group (59%) report subscribing to more than seven listservs or discussion groups. Due to the small number of respondents, the percentages reported cannot be generalized or statistically proven but a trend obviously exists in which the more advanced users participate in more electronic discussion groups than the beginners or intermediates.

TABLE 18 To how many listservs or electronic discussion groups do you subscribe?

	0 - 2	3 - 7	more than 7
Beginner	6%	75%	19%
Intermediate	8%	69%	23%
Advanced	6%	35%	59%

The Benefits of E-Mail for the Sample Population

The survey suggested a list of twenty-eight benefits from which the subject could select. The subject was encouraged to add any other benefits not listed in the questionnaire.² Table 19 reports the complete list of benefits with the percentage of respondents, by user level, responding to each benefit. The fourth column in the table is the percentage of the entire population who responded to the particular benefit (n=46).

² See Appendix 3 for a complete list of additional comments.

TABLE 19 Perceived benefits of electronic communication.

<i>Benefits</i>	<i>Beginner</i> <i>n = 16</i>	<i>Intermediate</i> <i>n = 13</i>	<i>Advanced</i> <i>n = 17</i>	<i>n = 46</i>
More efficient than other mediums of communication	88%	85%	82%	83%
Reduces "phone tag"	75%	92%	94%	87%
Eliminates world time differences	44%	46%	65%	54%
Reduces the need for travel	19%	23%	59%	35%
Greater awareness of the global environment	38%	77%	65%	59%
Allows time for reflection prior to response	75%	69%	82%	76%
Increases the speed of interaction	81%	69%	76%	76%
Access to more information via our colleagues	100%	100%	88%	96%
Facilitates broader subject knowledge	69%	69%	71%	69%
Ability to maintain regular connectedness with distant colleagues	81%	69%	88%	80%
Improves the quality of group decisions	25%	31%	35%	30%
Increases cross-professional communication	56%	85%	59%	65%
Ability to stay in contact with the client and the client needs	56%	38%	35%	43%
Facilitates greater involvement in professional associations	25%	31%	47%	35%
Broadens awareness of professional issues	81%	100%	94%	91%
Increases the quality of work and services to the client	44%	77%	71%	63%

Increases the explicitness of communications with more precise text	25%	8%	47%	28%
Allows time for reflection prior to response	56%	62%	82%	67%
Creates new perceived needs for information	63%	69%	65%	65%
Increases the variety of ideas	81%	92%	65%	78%
Can deal with larger amounts of information more efficiently	63%	62%	47%	57%
Can communicate at a time of one's own choosing	81%	85%	94%	87%
Less domination by certain individuals and more equality	13%	15%	24%	17%
Ability to speak more openly and freely	19%	31%	18%	22%
Eliminates many stereotypes such as race, sex, physical appearance or other credentials	25%	62%	41%	41%
Instills a sense of connectedness	63%	77%	41%	59%
Gives the opportunity to create communities of interest rather than geography	75%	69%	53%	65%
Reduces paperwork	38%	38%	47%	41%

For each individual benefit, it was hoped that a greater percentage of the advanced users would agree with the benefit compared with the other two groups. Of the twenty-eight benefits, only nine provide a trend supporting this hypothesis. Of those nine, five benefits (eliminates world time differences, reduces the need for travel, facilitates greater involvement in professional associations, increases the explicitness of communications with more precise text and allows time for reflection prior to response) showed a marked difference between the percentage of beginners and intermediate users compared to the advanced users.

Nine of the suggested benefits received less the 50% response from the total population (n=46). These include: reduces the need for travel (35%), improves the quality of group decisions (30%), ability to stay in contact with the client and the client needs (43%), facilitates greater involvement in professional associations (35%), increases the explicitness of communications with more precise text (28%), less domination by certain individuals and more equality (17%), ability to speak more openly and freely (22%), eliminates many stereotypes such as race, sex, physical appearance or other credentials (41%), and reduces paperwork (41%). Due to the low response on these nine benefits, their validity as true benefits of electronic communication is questionable.

Of the twenty-eight suggested benefits, six received over 80%

response from the total population (n=46). These include: more efficient than other mediums of communication (83%), reduces "phone tag" (87%), access to more information via our colleagues (96%), ability to maintain regular connectedness with distant colleagues (80%), broadens awareness of professional issues (91%), and can communicate at a time of one's own choosing (87%). The importance of these findings is that despite the differences between various levels of users, all have experienced these benefits to electronic communication.

Frequency of opinions on three of the benefits were in complete opposition to what was expected from each of the user groups. Instead of a greater number of the advanced group experiencing a particular benefit, the beginner group agreed with the suggested benefit in greater numbers. The three benefits are (1) ability to stay in contact with the client and the client needs, (2) can deal with larger amounts of information more efficiently, and (3) gives the opportunity to create communities of interest rather than geography. These differences may be attributed to type of library of which the respondent is a part. For example, the benefit of suggesting the ability to stay in contact with the client may be more important and practical in a small special library compared with a large academic library. To follow this through, large academic libraries may have had electronic communication for a greater

number of years due to their size and budget; therefore, a greater number of intermediate and advanced users may come from those institutions. A brief analysis of the data does provide evidence for the above speculation. The majority of the advanced users (70%) are from an academic institution where only 44% of the beginner users can be found.

CHAPTER 5

Conclusions

Summary

In Chapter One, a series of questions were asked that would be answered through this study. Those questions include: Does electronic mail draw the library community together into a more cohesive unit? Does e-mail *broaden* the professionals knowledge base through communication with librarians and/or non-librarians? Or, does e-mail *narrow* one's subject base because of the ability to communicate with a very *specific* group of people via specific discussion groups? Four of the suggested benefits will assist in answering these questions.

In terms of the library community, much of the communication is done through professional associations. When the respondents were asked whether e-mail facilitates greater involvement in professional associations, 47% of the advanced users agreed where only 25% of the beginner group and 31% of intermediate group did. The findings of this benefit correlate with the trend that the more advanced user will experience more benefits than the other two groups. An overwhelming majority of the entire user population felt that e-mail broadens awareness of professional issues, 94% of the advanced, 100% of the intermediate and 81% of the beginners. Once again, despite the majority

of respondents agreeing with the benefit, the trend is for the more advanced and intermediate users to experience the benefit than the beginner group.

Broadening the subject knowledge of an information professional is as important as a doctor knowing the latest medical techniques in that an information professional must continue to broaden his or her subject knowledge in order to provide the best possible service. When the respondents were asked if electronic communication provided access to more information through their colleagues, every single respondent agreed with the benefit except one advanced user. One of the suggested benefits asked directly if e-mail "facilitates broader subject knowledge." The response to this benefit is not overwhelming but it is virtually equal across the groups, 71% of the advanced and 69% of the intermediate and beginners. These results suggest that a greater access to information does not necessarily mean a greater subject knowledge base. For example, I may own an encyclopedia set and therefore have greater access to information but if I do not utilize that information, I will not increase my knowledge base.

Two benefits of particular interest are (1) less domination by certain individuals and more equality and (2) eliminates many stereotypes such as race, sex, physical appearance or other credentials.

In an environment in which there are no faces or voices, and perhaps not even a real name, it would be expected that these two suggested benefits would find a great number of supporters among any e-mail user.

However, among the information professionals in this study, a mere 17% agreed with the benefit suggesting less domination. A greater majority of respondents agreed that e-mail eliminates many stereotypes but the number is still very low (25% of the beginners, 62% of the intermediate and 41% of the advanced).

Conclusion

Due to the low response rate (20%) in this study, the findings cannot be generalized but they can suggest trends to look at and be aware of in the future of electronic communication among library professionals. The more significant findings suggest that the users of electronic communication are more active in professional organizations and communicate more frequently with a greater number of people, the more advanced they become in the use of e-mail. Almost all the respondents, regardless of the user level, used e-mail daily. As the user moved up the various levels, the user was more inclined to utilize electronic communication over other mediums of communication. Finally, the advanced users are more likely to subscribe to a greater

number of listservs than the other two groups although all three groups appear to be very active in terms of listservs.

In terms of benefits, the most popular benefits among all three groups are: (1) reduces "phone tag," (2) access to more information via colleagues, (3) a greater awareness of professional issues, and (4) can communicate at a time of one's own choosing. The suggested benefits that received the least amount of support were: (1) less domination by certain individuals and (2) ability to speak openly and freely. Out of twenty-eight suggested benefits, the advanced users were the majority group for thirteen benefits, the intermediate users were the majority for ten benefits and the beginners were the majority for the remaining five benefits. Overall, the more advanced users saw more benefits to electronic communication than both the other groups.

Limitations and Improvements

As with any study, there are certain limitations that will arise during the course of the research. Three of the primary weaknesses with this study were: (1) the method of selecting the participants (2) the wording of certain questions on the questionnaire, and (3) the choice to make the benefits list prior to sending out the survey. However, since this is a descriptive study, the limitations are minimized. If the

participants are drawn only from those who subscribe to listservs, then the people who use e-mail but do not participate with listservs, will be left out of the sample. The results will not be significantly influenced since experience has shown that the majority of the e-mail users subscribe to some form of discussion group. A second limitation to the study is the form in which the benefits of e-mail usage is presented to the subject. In choosing to make a list and asking subjects to select the benefits, the study runs the risk of losing any other benefits the user may experience. This problem was alleviated by conducting the pre-test and then by encouraging the subjects to include any other benefits that are not included on the list.

Certain questions on the survey needed to be better clarified to the subject. For example, when discussing e-mail, it should have been clear that it was e-mail on a wide area rather than intra-organizational. The other most significant question pertained to the number of professionals the subject came in contact with. Re-wording the questions to make it clear that "contact" or "communication" with other library professionals *included* electronic communication.

If a better response had been received, it would have been beneficial to compare the responses given on questions pertaining to in person communication within the work place and the actual size of the

organization. Responses to the questions pertaining to this may have been understood better in light of the size of the organization. For example, if a respondent states he or she does not come in contact with any other library professionals within their organization but it is not made clear that there are no other library professionals within that organization, a misunderstanding of the response can be made.

In choosing to create a list of benefits prior to sending out the questionnaire, a risk in eliminating any other possible benefits is made. Since the scope of this study could not permit respondents to randomly create benefits as the questionnaire was completed, it was necessary to select the benefits ahead of time. At the same time, users may not be the best subjects to attempt to draw up an exhaustive list of benefits. By drawing benefits from other studies and from personal experience, a list of benefits was provided to the respondents which provided a solid framework from which the study was conducted.

Improvements to the study could have been made if more time had been taken to conduct the study. The low response rate might have been remedied by sending out the questionnaire to the subjects another time. Another possibility to improving the response rate, and therefore the validity, would have been to send out a short set of the pertinent and critical questions to the selected subjects. By spending a short, finite

amount of time conducting the study, the possibility of generalizing and statistically testing the study was significantly limited.

Suggestions for Further Research

This study could be extended in a variety of ways. Given a greater amount of time, a study which incorporates a survey plus a formal question and answer or discussion period with the subject would no doubt improve the results of the study. As seen through several examples in the literature review, most of the studies incorporated a variety of data gathering tools to conduct their studies. In doing this type of research, any necessary clarifications from the survey could be made. In addition, discussion often facilitates brainstorming and would thus encourage more benefits to come to the surface.

This study looked at two significant factors associated with electronic communication. One, the characteristics of e-mail users among library professionals and, two, the perceived benefits of that use. Further studies could focus on either one of these characteristics. How library professionals communicate in the electronic environment versus communication prior to this type of media. Or, what are the benefits of electronic communication and *how* do they effect the services provided to the client.

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APPENDIX 1

QUESTIONNAIRE

Please answer as many questions as you can and as completely as possible. If you are unsure of an answer, please indicate that as your answer.

Name:

Title:

Name of Company or Organization:

Phone Number:

To what e-mail lists (listservs, BBS) do you subscribe or monitor?

How long have been using the Internet?

How long have been using electronic mail?

NOTE: In the following questions, please mark all your answers on the left margin with an X or a numeric value.

In what kind of library do you work?

- Academic
- Public
- School
- Corporate
- Government
- Other

How many library professionals are employed in your organization?

How many libraries are a part of your organization?

How many library professionals do you come in contact with each day at your place of work?

- 1-7
- 8-10
- 11-19
- 20+

How many library professionals do you come in contact with each day outside your place of work?

- 1-5
- 6-10
- 10+

How often do you communicate with other professional librarians within your organization?

- Once a day
- 3-7 times per day
- 8-15 times per day
- 15+

How often do you communicate with other professional librarians outside your organization?

- Yearly or bi-yearly
- Monthly
- Weekly
- Once a day
- 3-7 times per day
- 8-15 times per day

Is e-mail easily accessible at your place of work?

- Yes
- No

What forms of communication have you used this week? (mark all applicable answers)

- Telephone
- FAX
- E-Mail
- Regular mail
- In person

How often do you use the telephone for communication?

- Daily
- Weekly
- Monthly

How often do you use the FAX machine for communication?

- Daily
- Weekly
- Monthly

How often do you use e-mail for communication?

- Daily
- Weekly
- Monthly

How often do you use regular mail for communication?

- Daily
- Weekly
- Monthly

How often do you log onto your e-mail account?

- More than once a day
- Once a day
- Less than once a day
- Less than once a week

To how many listservs or electronic discussion groups to you subscribe?

- 0-2
- 3-7
- 7+

Do you actively participate in any state or national library organization, for example, American Library Association?

- Yes
- No

Are you on any committees at a state or national level?

- Yes
- No

What follows is a list of benefits broken into five categories. The list is not meant to be all inclusive. Please mark all the applicable benefits that you have experienced in your experience with e-mail. Following the list of benefits is an area for you to add any benefits you have experienced but are not included in the list.

Benefits of Time and Distance

- More efficient than other mediums of communication
- Reduces "phone tag"
- Eliminates world time differences
- Reduces the need for travel
- Greater awareness of the global environment
- Allows time for reflection prior to response
- Increases the speed of interaction

Benefits for the Professional

- Access to more information via our colleagues
- Facilitates broader subject knowledge
- Ability to maintain regular connectedness with distant colleagues
- Improves the quality of group decisions

- Ability to maintain regular connectedness with distant colleagues
- Improves the quality of group decisions
- Increases cross-professional communication
- Ability to stay in contact with the client and the clients needs
- Facilitates greater involvement in professional associations

Benefits of Quality

- Increases the quality of work and services to the client
- Increases the explicitness of communications with more precise text
- Allows time for reflection prior to response

Personal Benefits

- Creates new perceived needs for information
- Increases the variety of ideas
- Can deal with larger amounts of information more efficiently
- Can communicate at a time of one's own choosing

Other Benefits

- Less domination by certain individuals and more equality
- Ability to speak more openly and freely
- Eliminates many stereotypes such as race, sex, physical appearance or other credentials
- Instills a sense of connectedness
- Gives the opportunity to create communities of interest rather than geography

Please list or describe as many more benefits you have experienced as a result of e-mail.

APPENDIX 2

Range of Libraries

1. Robert Morris College
2. Navacor Research and Technology Corp.
3. Colonial Williamsburg Foundation Library
4. H.W. Wilson Company
5. University of Dubuque
6. James Cook University of North Queensland
7. Simpson Library, College Library
8. Bemidji State University
9. Pocatello Public Library
10. Ford Motor Company
11. Montgomery County Public Libraries
12. Harvard Law School Library
13. Oklahoma State University
14. Swinburne University of Technology Library
15. Indiana University
16. Federal Government Energy Library, U.S. Dept of Energy
17. Computerworld
18. University of Texas at San Antonio
19. University of Wisconsin, Parkside
20. West Virginia Northern Community College
21. Quebec Industrial Research Centre (Crown Agency)
22. American Bible Society, Corp.
23. Lamar University
24. University of Texas at Arlington
25. Hartwick College
26. Cushwa-Leighton Library, St. Mary's College
27. Indiana University School of Medicine
28. Concordia University
29. U.C. Berkeley, Business and Economics Library
30. Cold Spring Harbor Laboratory
31. The Brookings Institution
32. Washington and Lee University
33. University of California, Irvine
34. Princeton University Libraries
35. North Dakota State University
36. Colorado State University
37. University of Delaware
38. Pellissippi State Technical Community College
39. UCLA
40. LabTek Corporation
41. MCNC (a R&D not for profit private company)
42. Ligature, Inc.
43. Apple Computer
44. Idaho State University
45. Griffith University, Australia
46. Defense Technical Information Center (DTIC)

APPENDIX 3

Other Comments:

#1 -- I have worked in environments where e-mail has been available and where it has not been available. Once you get used to it, like any other office or communication tool, it is hard to do without. It is slowly creeping into the culture and is a wonderful way of communication and documenting one's activities. However, it does require being able to manage your files, and those who weren't so hot at doing it manually, will probably have trouble doing it electronically. I should know, I am one of those people.

#5 -- Don't have to find paper, pen, addresses, stamps.
No one is offended if you have only a brief message.

#6 -- At the moment very "American based". Hence a lot of talk is irrelevant (at the same time other information is interesting). American participants need to be more aware that it is world based rather than US based. E-mail is great for hard to find reference questions as you can contact so many libraries at once - I have used e-mail for this with great success! However, lately there seems to be too much unnecessary talk going on. People need to consider what they send.

#7 -- Allows a more informal access to people in the profession, people who you could not call to ask a question or gain a response but can e-mail.

#11 -- Learn about sources of info; improve reference techniques; see good vs. better, more complete answers --- but, it's not all sunshine and light, it's all fascinating but it sure does eat up lots of time; allows misinformation to be spread more rapidly.

#12 - Opportunity to seek out new solutions to old problems.

#14 - All of a sudden the world is a much smaller place - it's great to be able to communicate so easily with colleagues around the world. I have found professionals I have contacted through e-mail but never met personally have been extremely friendly and helpful. The sharing nature of e-mail and the discussion groups is astonishing - there is a real sense of community spirit.

#17 - can obtain critical information more quickly.

#18 - I often tell people that the net is more important to me than printed professional journals in keeping up to date and in touch with my profession.

#20 - The most important part of e-mail to me is knowing that there are people out there to help you. By placing a question on a discussion group, people e-mail you responses. You can then learn others experience and get new ideas. You come in contact with people that you would never know otherwise.

#21 - Reduces long distance calls.

#25 - Wider range of ideas and personal contacts, greater appreciation of the interests, ideas, commitment of others, greater feel for breadth, if not depth, of issues.

#27 - E-mail is a relatively simple and effective way to get people to use the Internet, and to become more comfortable with computer technology. A colleague and I have used e-mail to send drafts of a manuscript back and forth for editing.

#30 - There is still domination by certain individuals. They write very often and always share their views which I think intimidates many lurkers. Most of the Internet benefits are from the information I find using gopher and WWW.

#32 - Creates a new style of communication, in which the writer responds much more immediately (more like f2f conversation) but doesn't have to load up with ums and ers -- some editing possibilities that speech doesn't afford.

#33 - Ability to keep us with current issues without necessarily having to participate in discussions or programs.

#39 - I certainly don't think it gives more time for reflection, but it does make quick response easy and saves the time it takes a letter to get from one place to another.

#40 - It facilitates maintaining an archive of messages in an electronically searchable media. This helps to retrieve prior discussions and prevents overlooking important decisions that were made.

#41 - The ability to transfer information in a medium (Electronic) that makes it easier for use in other situations. Most notably, I e-mail the results of information searches to the researchers. Since it is in electronic format, they can easily put the information into another document/e-mail/etc. without retyping or mistyping.

#44 - Can increase timeliness, which is not the same as efficiency.

#45 - speed of delivery and response.

monetary savings - savings in telephone calls/time

ability to seek advice from a much wider audience than traditionally possible.

#46 - Learned of others with similar interests and perspective.

Made the US and perhaps outside our borders a library without walls.

1. The numbers correspond to a unique number assigned to each of the respondents.