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COMMUNITY TIES AND A COMMUNITY NETWORK:
CUPERTINO'S COMPUTER-MEDIATED CITYNET

A Thesis

Presented to

The Faculty of the

School of Journalism and Mass Communications

San Jose State University

In Partial Fulfillment

of the

Requirements for the Degree

Master of Science

by

Janice C. Morgan

August, 1997

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ABSTRACT

COMMUNITY TIES AND A COMMUNITY NETWORK: CUPERTINO'S COMPUTER-MEDIATED CITYNET

by Janice C. Morgan

This case study applied a community attachment framework to a qualitative study of Cupertino's CityNet, a computer-mediated community network. In-depth interviews were conducted with 22 CityNet panelists and 7 key CityNet volunteers and city employees. Community attachment theory predicts the greater the community ties, the greater the use of local newspapers. Panelists exhibited a strong attachment to the community as members of organizations, leaders of community projects, and readers of multiple community-news sources. They used CityNet for gathering local news and for maintaining relationships.

CityNet provided an informal setting for parent-teacher and teacher-student interactions. The value of informal communications, not a community attachment concept, was a surprising research finding.

The evidence indicates that community attachment provides a robust explanatory model for examining community ties at the intrapersonal, interpersonal, and societal levels. But the evidence less adequately explained the interactive and interpersonal uses of the network.

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CityNet representatives Wally Dean and Chuck Thompson were instrumental in helping me propose a feasible project, given system privacy constraints and the need to identify study participants for interviews. I am equally indebted to the CityNet subscribers who were interviewed for this study.

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CHAPTER I

INTRODUCTION

The Internet is the fastest growing form of communication in history, faster than television, radio, fax, or telephone. Its phenomenal growth is shown by 50,000 networks in 65 countries crowding 25 million people onto the information superhighway (Strangelove, 1994). Within this bustling electronic community are new places to conduct business, engage in civic debate, and research family genealogy. Electronic networks have the potential to impact social, political, and communication processes at work, school, and home.

The precursor to the Internet, the Advanced Research Projects Agency Network (ARPANET), emerged during the 1960s (Dern, 1994). The ARPANET was sponsored by the U.S. Department of Defense to connect 1,000 scientists, researchers, and educators who were collaborating on weapons-related research (Rheingold, 1993). The network was designed without a central control point to prevent disruption in the event of an act of war, terrorism, or natural disaster.

An electronic mail message could be sent from one person to another or from one person to a distribution list of people. The same message could be forwarded on to yet another distribution list. By 1980, the ARPANET was replaced with a faster, high-speed network run by the National Science Foundation. It pulled corporate, government, and educational networks together into the Internet (Freed & Derfler, 1994). Then in April,

1995, the National Science Foundation turned off the backbone network, letting the private sector take over the Internet business.

From 1985 to 1990, declining computer prices, faster computer processing speeds, growing storage capacity, increasing bandwidth, and improved information displays encouraged more people to place powerful computers onto home desktops (Biocca, 1993). Yet, computer expertise and cost remained barriers to broad Internet access. The need to eliminate barriers to information sharing has been a recurring theme throughout U.S. history. When Thomas Jefferson promoted the need for a free marketplace of ideas, newspapers were not readily available. So he proposed the removal of one information access barrier: "Weighing all probabilities of expense as well as of income, there is a reasonable ground of confidence that we may now safely dispense with . . . the postage on newspapers . . . to facilitate the progress of information" (Jefferson, 1801, p. 3).

Sharing information widely is part of the public-access vision for the Internet. Still, economic and computer literacy barriers must be removed before that can happen. This multiple-year, possibly multiple-decade project of removing information-access barriers began when Vice President Gore, as a U.S. Senator in 1991, proposed the High Performance Computing Act. This successful effort, coupled with Bill Clinton and Al Gore proposing the National Information Infrastructure during the 1992 presidential election, piqued broad public interest in building the digital superhighway (Freed & Derfler, 1994).

Although public access is central to the vision of a National Information Infrastructure, the U.S. Congress has yet to pass legislation ensuring low cost availability (Eddings, 1994). Instead, the U.S. Congress and commercial organizations debate licensing, censorship, and control of the delivery pipelines to homes. At the same time, competitors in the cable, telecommunications, data communications, and multimedia industries battle for the opportunity to pump more and more mediated information into U.S. households (Biocca, 1993). The technology is available and providers are ready to deliver services. But Internet service will not be as widely available as telephone and cable service until commercial providers and regulatory agencies resolve issues of control.

Most of the Internet debate focuses on conflict of interest among commercial service providers, with little discussion about the Internet's unique community-building capabilities: "The notion of community has been at the heart of the Internet since its inception. Scientists used the Internet to share data, collaborate on research, and exchange messages" (Armstrong & Hagel, 1996).

Community on the Internet

The term "community" traditionally implied a strong sense of place, constituting the room, village, or city where interactions occurred. Yet, electronic communities existed without physical place: "In virtual communities, the sense of place requires an individual act of imagination" (Rheingold, 1993, p. 63). People log on to networks for community,

communities within chat rooms, and communities of special interests. Nearly 20 years ago Toffler (1980) envisioned a network of community users: "The electronic cottage could help restore a sense of community belonging and touch off a renaissance among voluntary organizations like churches, women's groups, lodges, clubs, athletic, and youth organizations" (p. 204). The Well started in 1985 as an experiment in on-line community building within the San Francisco Bay Area. Researchers noted evidence of subscribers to the Well developing strong personal relationships off-line after meeting initially on-line (Armstrong & Hagel, 1996; Rheingold, 1993). Whether on-line communities were formed for business, fantasy, or relationship purposes, they offered two-way interpersonal and mass communications.

Newspapers provide one means of learning about community and political activities. Community networks offer another way to learn about the local community. Local newspapers and community networks both deliver text-based information of local interest to residents of a city, region, or other geographically identified area. A typical distinction between national media and local media is the latter's focus on local people, nearby schools, city government, community issues, and local events. A local network may not be visible to non-subscribers and it may not be visible to World Wide Web users.

Built on the concept of social integration, the community attachment framework examines the mechanisms by which an individual is assimilated into or learns about the community. This study examined whether a "community attachment framework,"

traditionally applied to local newspaper-readership studies, could be applied to subscribers of a local electronic network.

Rationale for the Study

Local networks and their subscribers have been overlooked in previous research. Very little research existed on how and why individual subscribers use community and civic networks (Beamish, 1995; Molz, 1994). Developing a better understanding of how and why people use electronic networks will continue to be important for commercial and non-commercial purposes. Community networks offer a new place to study community and communications at the societal level of interaction. Reid (1991) proposed that various academic disciplines needed to address post-industrial and post-modern phenomena by incorporating the challenges and capabilities of communications on the Internet. This need required a redefinition of existing boundaries between written and spoken, interpersonal and mass, and synchronous and asynchronous communications.

Biocca (1993) found that the man-conforming-to-technology model had been replaced by a model of technology conforming to man. Therefore Biocca (1993) recommended research on the influence of new media on the social-design process.

Current community and civic-networking literature cataloged the development paths, content choices, and policy decisions of various community and civic networks visible on the World Wide Web. Little research existed about the network subscribers who communicated over local networks. Additional research on community networks, beyond

documenting policy-and-development decisions, is needed to help fill the void about who uses local networks (Molz, 1994).

CityNet in Brief

In 1993, a group of Cupertino leaders from school, business, government, and community sectors built CityNet to create affordable Internet access for schools, businesses, and residents (Cupertino Chamber of Commerce, 1995). CityNet was co-developed by former Cupertino Mayor Wally Dean and Robert Kim, a local software consultant and former City of Cupertino employee. CityNet is a non-profit, all-volunteer electronic-mail network connected to government offices, schools, and to every household with a subscription.

A CityNet subscriber receives an hour a day on the system to handle communication needs. CityNet is not visible to World Wide Web users because it is a protected and isolated closed sub-network. Also, CityNet requires users to log on with a legal name unlike many commercial electronic networking services. CityNet is funded primarily with user subscription fees of \$40 a year for residents and \$50 a year for non-residents. A volunteer staff runs the network, writes grants for technology upgrade needs, brings new subscribers on-line, and serves as the Help Desk for resolving system problems. CityNet was built by a partnership involving the Fremont Union High School District, Cupertino Union School District, AT&T, and Pacific Bell, with equipment grants from local and nationwide computer and telecommunications companies.

Research Questions

This study focused on how and why panelists used CityNet. Data was gathered from three sources for analysis: phase one interviews with volunteers and City of Cupertino employees, CityNet documentation, and in-depth interviews with CityNet subscribers. Seven key CityNet volunteers and City of Cupertino employees were interviewed for background information. Existing CityNet documents were reviewed to understand the subscription and installation process, and externally-oriented CityNet grant proposals were also reviewed to understand the network's development approach. Finally, 22 in-depth interviews were conducted with CityNet subscribers. The research also assessed how well the community attachment framework applied to an electronic community network. The research questions are as follows:

- (1) Who is using Cupertino's CityNet?
- (2) Why are CityNet subscribers using the network?
- (3) What meaning does an individual CityNet subscriber find in his or her on-line community networking experience?
- (4) How does CityNet differ from other civic and community networks in the United States?
- (5) How well does the community attachment framework apply to an electronic community network?

Overview of the Study

The researcher examined how and why individual subscribers use CityNet. An in-depth interview instrument based on community ties provided a consistent way to assess two patterns: a subscriber's individual ties to the community and a subscriber's intrapersonal, interpersonal, and societal experiences with CityNet. Finally, CityNet was compared with the three major U.S. community and civic networks discussed in the print-literature.

CHAPTER II

LITERATURE REVIEW

Gradually, the Internet has created new places for both mass and interpersonal communications to develop. Therefore, the literature review examined community attachment, public access, mass and interpersonal aspects of networked communications, and electronically supported work-group research. The findings of that review created a foundation for examining a citywide community network. The multifaceted capability of electronic communication warranted this approach to the literature review. The community attachment framework has traditionally been applied to newspaper readership studies. Community attachment is defined as community ties formed as both a result of and antecedent to newspaper use. A cause-and-effect relationship was not documented. A review of existing community attachment literature provided consistent definitions for community ties, affiliations, and linkages which in turn provided a means of identifying community ties with the CityNet panelists.

Public Access

Only a fraction of the globe was on the Internet when the U.S. Advisory Council for the National Information Infrastructure (1993) proposed: "Extending the universal service concept to ensure that information resources are easily available to all Americans at affordable prices" (White House Order #12864, 1993). The Internet's ability to link a vast array of information was further discussed in the actual council document:

All Americans have a stake in the construction of an advanced National Information Infrastructure (NII), a seamless web of communications networks,

databases, and consumer electronics that will put vast amounts of information at users' fingertips. Development of the NII can help unleash an information revolution that will change forever the way people live, work, and interact with each other. (National Information Infrastructure, 1993, p. 1)

Anderson, Bikson, Tora, Law, and Mitchell, (1995) identified five barriers to nationwide electronic mail access: limited home computer access, a growing gap between the haves and have-nots of computer access, lack of standardization among computers, absence of any vital application that would turn electronic mail into a necessity, and the small role of public-access sites for computer use. Computer literacy and public access have become critical to prepare citizens for future roles. Those needs have become similar to the literacy needs noted more than 70 years ago by Park (1925):

The growth of great cities has enormously increased the size of the reading public. Reading, which was a luxury in the country, has become a necessity in the city. In the urban environment literacy is almost as much a necessity as speech itself. (p. 125)

Urban society has placed greater literacy demands on citizens than the oral tradition of a more rural society. Citizens must now be computer-literate to be hired by employers, to complete school assignments, and even to conduct some community tasks.

But the demographics of current Internet users have not reflected a cross-section of Americans. In fact, users of the Internet were found to be predominantly young, middle-class males who owned a personal computer and modem, and held four-year or advanced college degrees (Anderson et al., 1995; Molz, 1994). That elite group of Internet users primarily accessed the Internet through work and school; 90% were male, the median age of the on-line users fell between 30 and 34 years, and the largest age group

group on-line fell into the 25 to 29-year-old range (Plotkinoff, 1995). By 1985, only 20% of American households had home computers (Chesebro & Bonsall, 1989); and by 1996 the same number of American households now had a modem linked to the home computer (Antonucci, 1996).

The most significant factors preventing home-computer access have been age, gender, and ethnicity (Anderson et al., 1995; Molz, 1994). The lack of public-access potentially places some citizens at a disadvantage, limiting Internet use to computer and modem owners, or to those with institutional access. Furthermore, the cost of continuous technology upgrades may have been prohibitive to any home-computer-network user lacking the support of a corporate, institutional, or commercial network.

Electronic Networking Features

Networked computers linked to modems permitted a user to send and receive electronic mail, visit various user groups, and scan the World Wide Web (Eddings, 1994). Without a central control point, the Internet user had more control over the channel than in a one-way communication model. An electronic mail user could read every thread of a conversation on a discussion group and never post a message, or could choose to contribute a message (Hiltz & Johnson, 1989; Meyrowitz, 1995; Pickering & King, 1996). In either scenario, by passively reading or actively posting, the electronic-mail user and reader were engaged with on-line content. Meyrowitz (1995) found on-line environments created an equalizing force in which users were not identified by the

isolating characteristics of place, differences of stages of socialization, or differences in obvious visual references to gender, age, and physical traits.

McMurdo (1995) noted how asynchronous capabilities of electronic mail and voice mail were changing interpersonal communications by eliminating the need to reply immediately to a message. This delay added an opportunity to review, edit, and prepare responses. In some cases, the extended preparation time resulted in impersonal, task-oriented, and hostile messages. In other cases, McMurdo (1995) found the extra time helped senders create warm messages, which over time contributed to interpersonal relationship-building. McMurdo (1995) highlighted other facets of electronic communication including the ability to transmit to one person or to tens of thousands of people, the ability to send precise communication over distances, and the ability to have instant message delivery.

The impact of electronic networks may be gradual, depending on how quickly mass users adopt the new technologies. Electronic networking might vary from its early use and original intended use, as the telephone did. For example, the telephone was once thought of as strictly a business tool, but popular use brought it into demand for social purposes (Rheingold, 1994; Williams & Rice, 1983). In the same way, electronic-mail networks, considered business tools today, tomorrow might serve broader social, teledemocracy, and community-building purposes.

Simultaneously a Mass-and-Interpersonal-Communication Environment

As new media emerged from the convergence of computers, microprocessors, expanded cable, and telecommunication services, the distinction between interpersonal and mass communications blurred. Williams and Rice (1983) recommended rethinking the traditional context of identifying communications as either interpersonal or mass, in favor of delving into more qualitative, experimental research, aimed at considering the interactive qualities of each new media.

New media defied easy categorization as solely interpersonal or mass communication, because users were free from time and place constraints and engaged in two-way, interactive communications (Rice, 1987; Tomita, 1980). Several researchers (Beniger, 1987; Jeffres, Dobos, & Lee, 1988) suggested the need to reformulate the interpersonal-mass distinction and study the subjective effects of communication on receivers and the causes of these effects. Reardon and Rogers (1988) challenged the arbitrary assumption of defining face-to-face interaction between two or a few people with opportunities for feedback as interpersonal. The researchers favored a more holistic approach:

A total communication process cannot be adequately understood by only one of the two sub-disciplines. For example, a scholar interested only in interpersonal or mass media channels could not fully understand the innovation-decision process. (Reardon & Rogers, 1988, p. 295)

A community network offered an environment for testing both the mass and the interpersonal aspects of communication theories (McLaughlin & Rafaeli, 1994). A number of studies examined the impact of electronic communications on group and

organizational communication effectiveness using both mass and interpersonal communication models. (Fulk & Desanctis, 1995; Hiltz, Johnson, & Turoff, 1986; Howells, 1995; Lind & Zmud, 1995; Zack & McKenney, 1995).

Walther (1996) proposed that impersonal, electronic communications could be positive if the communications met a need. He examined computer-mediated communication research and found electronic communications had the ability to offer intrapersonal, interpersonal, impersonal, and even hyperpersonal interaction.

Another pair of researchers (Parks & Floyd, 1996) discovered some personal relationships within the Internet that challenged existing interpersonal and relationship development research: "Just over 60% of the people in our random sample reported that they had formed a personal relationship of some kind with someone they had first contacted through a newsgroup" (p. 93).

Special networks grew to serve the needs of educators, scientists, and various professionals sharing similar interests: "CMC [computer-mediated communication] technology made possible something that human communications could not do previously. A geographically dispersed group of people can now use the written word as a conversational medium" (Rheingold, 1993, p. 180). Mass-communication researchers have not had a theoretical model that integrated the mass-and-interpersonal communication capabilities of electronic networks.

Electronically Supported Groups

The use of electronic networks by work groups was explored here to identify characteristics and usage that might extend to civic and community groups. December (1995) grouped electronic communication activity into three categories: seeking information, developing or maintaining relationships, and accomplishing tasks. He further suggested that Internet activities occurred within a communication, interaction, or information space. Considering the Internet as a conceptual place is further supported by Molz (1994), who characterized on-line civic networks as new places with new rules for democratic participation.

The Internet provided a way to keep professionals connected to work, peers, and special interest groups while they telecommuted or worked as independent contractors (Pickering & King, 1995; Spitzer & Wedding, 1995). Electronic-network users exhibited more ties to social and civic groups and worked from home more than non-electronic-network users (Anderson et al., 1995).

In the workplace, Burke and Chidabaram (1995) found that electronic and face-to-face supported work teams appeared equally cohesive and effective when given adequate time and training. Actually, a more timely exchange of accurate information occurred leading to better leadership and coordination among work teams. Orlikowski, Yates, Okamura, and Fujimoto (1995) reported computer-conferencing-system use for a project team improved when a few individuals promoted its adoption at first implementation and continued to promote its use over time. Furthermore, researchers

noted a breaking down of barriers and hierarchy between levels of management and organizations with an electronic messaging system (Howells, 1995; Rice, Grant, Schmitz, & Torobin, 1990). Armstrong and Hagel (1996) noted that commercial enterprises rarely encouraged communications between visitors to an electronic site. In addition, commercial enterprises were slow to understand and use the unique community-building capabilities of interactive Internet communications. Electronic networks proved to support information sharing among co-workers, and demonstrated an equalizing effect among users, regardless of organizational rank or status.

Existing Models of Community Networks in the U.S.

The Internet and its use have developed the potential to strongly influence existing social and communication patterns. Kanfer and Kolar (1995) tabulated the number of U.S. city networks on the World Wide Web as 600 and growing. A framework used to catalog the capabilities of various U.S. city networks accessible on the World Wide Web provides a consistent method for describing community-based network capabilities (Beamish, 1995). Although increased civic participation was a goal for most community networks, few actually held public discussion forums, and few provided direct interaction with civic leaders. According to Beamish (1995), the lack of permanent funding, volunteer staffing, obsolete technology, and the escalating expectations of subscribers continued to plague community networks in the United States.

The three U.S. networks frequently identified in on-line and print-literature searches for community and civic networking were Cleveland's FreeNet in Ohio, Santa Monica's

Public Electronic Network (PEN) in California, and the Blacksburg Electronic Village (BEV) in Virginia (Beamish, 1995; Molz, 1994). Cleveland's FreeNet, the oldest community network in the country, started in 1986. Santa Monica's Public Electronic Network (PEN) started in 1989. PEN had the distinction of transforming itself from a one-way, bulletin-board system to an interactive, World Wide Web accessible, teledemocracy project (O'Sullivan, 1995). The Blacksburg Electronic Village (BEV) network started with a presence on the World Wide Web in 1993. BEV was distinguished as the most robust example of government, community, university, and corporate organizations collaborating to design a community network.

Guthrie and Dutton (1992) documented the development and policy choices made by Santa Monica's PEN related to public access, capacity, system architecture, content, ownership, editorial control, financing, and one-way versus two-way networking. O'Sullivan (1995) found that PEN's hardware and software design accomplished teledemocratic goals of early and continuous participation in both policy-formation and decision-making processes of local government. He concluded that PEN, the first interactive, government-sponsored, computer network, was well-suited for facilitating pluralistic political participation. Overall, community and civic networks offered social benefits such as access to government, the Internet, and information resources (Molz, 1994). Community attachment was selected as an explanatory framework because it was broad enough to encompass both the mass-and-interpersonal-communication capabilities of electronic networks.

Community Integration and Newspapers

Societal changes over the last 70 years included what Park (1925) noted as a lost sense of community experienced with the migration to cities: "Everyone called everyone by his first name. The village was democratic. We are a nation of villagers. Our institutions are fundamentally village institutions. In the village, gossip and public opinions were the main sources of social control" (p. 128). Whether the communications mechanism was word-of-mouth or a local newspaper, community and communications have been intertwined for some time.

Studying the readership of local newspapers for community news and issue information has been the subject of research beginning with Park (1925) and Janowitz (1967) who established the baseline for community attachment. Both tracked the series changes or milestones of individuals and families during their assimilation into the growing urban community. The history of American newspapers and the integral, even political role newspapers fulfilled in society were first traced by Park (1925): "Through the newspapers the whole country was enabled to participate in the discussions by which issues were framed and legislation was enacted" (p. 131). The community press was a tool, a key support mechanism for facilitating community integration, and for documenting the home community by publicizing marriages, divorces, births, deaths, crimes, and politics (Park, 1925).

During the 1960s, Janowitz (1967) presented a scholarly study essential to understanding the urban community and its weekly newspaper amidst debate about the

deterioration of communities. Janowitz's (1967) research built upon the community-integration hypothesis, and predicted the greater the community integration, the greater the newspaper use. He addressed the concept of the community press as a social mechanism for assimilating the individual into urban society. With an eye toward the future, Janowitz (1967) envisioned citizens in an advanced industrial society using a local communication vehicle as a means for coping with and balancing complex roles, relationships, and responsibilities at home, work, and in the community.

Earlier, Edlestein and Larson (1960) suggested the neighborhood newspaper went beyond its commercial intent, and served as a catalyst to help integrate the individual and groups into the community. The researchers found attentive newspaper readers to be long-term residents of their communities who viewed their local city as community, and actively participated in community affairs.

Brown and Daves (1979) determined that length of residency and stability in the community were not sufficient indicators of whether an individual had community ties. The researchers found that various perceptual and tangible connections leading to community attachment were more important than age, years of residence in the community, socioeconomic status, family income, or education. Beyond community attachment, several researchers explored how and why readers used newspapers.

Stevenson (1979) found that newspapers fulfilled diverse roles among readers: providing a way to organize some reader's lives, serving as a pastime for some, and acting as a source of information to guide small talk for others. Demers (1993) found that social

ties generally stimulated the need for information and that community involvement stimulated local-newspaper use. Although the community attachment framework predated electronic-network communications it may provide an appropriate framework for analyzing community network use at the intrapersonal, interpersonal, and societal levels of analysis.

Definition of a Community Tie

According to Stamm and Fortini-Campbell (1981) early community attachment research was problematic because of vagueness about what constituted community ties. "Community" was the name assigned to a neighborhood, a close-knit group, a church community, or an association with similar interests or beliefs. Previous community attachment research identified three types of communities: places, informal social groups, and formal organizations (Stamm & Fortini-Campbell, 1981). For the purposes of this study, community pertains to a place or a city.

Community attachment typically described what the individual was tied to and the nature of the tie (Stamm, 1988). Community ties were traditionally measured by characteristics such as: marital status, home ownership, age, gender, level of community attachment, participation in community events, leadership on community issues, city council meeting attendance, church attendance, shopping in the city, and community memberships.

The general model of community attachment split community ties into either elements or relations. Elements outlined by Stamm (1985) were either tied to individual,

family, and household entities, or tied to community as place, process, or structure.

Relations either were defined as spatial, cognitive, affective, and communication, or were defined as spatial, political, social, and information gaps. Furthermore, Stamm (1985) defined that ties related to place, process, or structure in the community. Ties to place meant cognitive knowledge about features and benefits of residing in a particular community. Ties to process meant active citizenship and participation-orientation. Ties to structure meant maintaining a closeness, a neighborliness, or some social affiliation within the community.

Stamm (1985) noted five types of community ties: "community attachment," an affective tie between an individual and a community institution; "community identification," a cognitive tie between an individual and a community institution; "membership," a spatial tie between an individual and a community institution; "participation," a spatial tie between an individual and a community process; and "involvement," a communication tie between an individual and community process.

Establishing the strength of functional ties to community was important in understanding community attachment. Readership of the local press correlated with functional links such as family integration, residential stability, and voluntary organization membership (Stamm & Fortini-Campbell, 1983; Stevenson, 1979).

Levels of Community Involvement

Evaluating the level of individual community involvement was critical in determining community attachment. Stamm and Fortini-Campbell (1983) suggested five

levels of community involvement. At the first and lowest level of involvement, "attending," an individual had only a basic awareness of community. At the second level, "orienting," the individual distinguished where the community stood on various issues. On the third level, "agreeing," an individual related to the community, its concerns, and views. On the fourth level, "connecting," an individual connected with other community members by talking, listening, or getting together. Finally, at level five, "manipulating," individuals worked for change in the community.

Stamm and Fortini-Campbell (1981) found that the simplest form of involvement, interest in keeping up with community events, was the most important factor motivating involvement. In addition, community involvement, and community orientation were linked closely with the more visible demographics of stability in place of residence, home ownership, and voting (Stamm & Fortini-Campbell, 1983; 1981; Stephens, 1978). Stamm and Fortini-Campbell, (1983) found a resident's interest in keeping up with local community activities to be the best single predictor of newspaper readership. Researchers (Stamm & Fortini-Campbell, 1983; 1981; Stephens, 1978) found also that those working for change in the community read more papers, spent more time reading, were older, and owned their homes. A self-measure of closeness to the community was suggested by researchers (Stamm, 1985; Stamm & Fortini-Campbell, 1983) to understand an individual's intrapersonal feelings about closeness to the community. Researchers (Demers, 1993; Stamm, 1985) also found that personal experiences and interpersonal discussion increased as community attachment increased, and that people who were more

attached to a community read the newspaper more than those who were less attached to the community.

A Technology Rich Community

Building the on-ramp to bring citizens to the information superhighway has been a vision for some communities and has become a reality in Cupertino, CA. This city of 43,489 people, home to three *Fortune 500* computer companies: Tandem Computer, Apple Computer, and Hewlett-Packard Company, also has become a bedroom community for many high-technology company employees.

While modem home use was estimated to be 20% for the nation, it was estimated at twice that rate, 42%, for Santa Clara County residents. Of the 408-area-code residents, predominantly in Santa Clara County, 52% were estimated to have a home computer (Antonucci, 1996). Both percentages were much higher than the national average. Pacific Bell recently stated that the 408 area code would be exhausted in two years because of the exponential growth of modem, pager, fax, and cellular telephone use in Santa Clara County: "It is not unusual for households in the Silicon Valley to have more than one telephone line--one for voice, one for fax, and increasingly one for a computer modem" (Bryant, 1996, p. 8).

Developing a Community Network

In 1993, a group of 25 Cupertino leaders, representing primary students to seniors, formed the electronic network CityNet, which is now run by a volunteer Board of Directors. The founders' main purpose was to decrease fears about technology use. Its

other purposes were to increase student access to learning resources and to link local residents to city hall, schools, community groups, and the Internet. CityNet was an experiment designed to bring the haves and have-nots to the Internet and to city government. CityNet subscribers have received electronic copies of city forms, placed library books on hold, and paid for the dog's license from home computers. CityNet repeatedly made headlines in national and local news segments for its many firsts. It created the first interactive, non-profit, community network. It enabled the first wireless connections to city government. It was the first city to electronically connect residents to the U.S. Postal Service.

Vice President Al Gore visited CityNet twice, citing it as a model of affordable community networking. CityNet was also recognized in 1994 as a finalist for the *Smithsonian Technology Innovation* award based on endorsements from Vice President Al Gore and former Hewlett-Packard Company Chief Executive Officer John Young (Viscovich, 1995).

CityNet's Architecture

Technology has changed dramatically since CityNet implemented its original system in 1993. The network needs to be upgraded with high-end workstations to meet subscriber demand for faster access to a wider range of graphical and video Internet resources available on the World Wide Web. CityNet's system architecture, which was based on 1993 technology, used two 28.8 modems and had a T1 line to add CityNet to 8 ISDN lines. The architecture also included two analog phone lines, so that CityNet could

support twenty-two simultaneous users (Thompson, 1995). Although CityNet did not provide World Wide Web access, it did provide electronic-mail access to the Internet, to various newsgroups, and to local subscribers.

Proceeding with a Community Attachment Framework

Ensuring broad access to the Internet has not been a given. But community networks such as CityNet offered an affordable alternative to commercial providers. Although computer literacy training reduced fear and misconceptions about computers, an easy-to-use local network might move more non-computer users to the information superhighway more quickly. More importantly, local networks could help restore a sense of community for residents who work long hours, for those isolated at home with medical conditions, or for full-time caregivers. A community network might also support the telecommuting or work-at-home employee trying to balance work, family, home, and community responsibilities.

Stevenson (1979) noted that newspapers fulfilled diverse roles in readers' lives and community networks might also fulfill future diverse roles as yet unknown. Since mass-communication researchers have not yet applied the community attachment framework to electronic communications, this research aims to fill that void. Although the community attachment framework predated electronic-network communications, it still provides an explanatory model to examine the community attachments of a panel of CityNet subscribers. The framework also provides a way to discuss how and why a panel of CityNet subscribers use the community network. According to community attachment,

residents who demonstrated the strongest ties to the community also worked for change in the community, read more newspapers, spent more time reading, were older, and owned their homes (Stamm & Fortini-Campbell, 1983; 1981; Stephens, 1978). The community attachment framework supports tracking levels of urban community involvement for the individual and family being assimilated into a community. This framework provides a way to study and analyze how CityNet enables subscribers to participate in community issue discussions. If the community press is a tool for facilitating community integration, then a community network may also facilitate similar community integration.

Measuring Conceptual Community Ties

In previous studies the following set of community ties were consistently measured: length of residence, plans to move, presence of children, self-identification with community, marital status, home ownership, community memberships, and civic activity. The above characteristics and demographics can be applied to subscribers of a community network. At an intrapersonal level, feelings of closeness to the community can be documented with the same self-measure of closeness to the community developed for community-newspaper readership studies.

An in-depth interview guide was used in previous community attachment research to measure community attachment elements and relations. Research on community ties assessed overall community attachment, community identification, community institution membership, participation, and involvement. All five types of community ties noted by Stamm (1995) and the strength of functional ties such as family integration, residential

stability, and voluntary organization membership were measured by the in-depth interview instrument used in prior studies. Individual ties to community were further determined in previous research through the use of open-ended questions added to the interview process (Brown & Daves, 1979; Demers, 1993; Jeffres, Dobos, & Lee, 1988; Stamm, 1988; Stamm & Fortini-Campbell, 1983; 1981; Stamm & Weiss, 1983; 1980; Stephens, 1978; Stevenson, 1979). The in-depth interview instrument for this study included the recommended element and relationship items from the community attachment literature.

A Framework for Examining Network Choices

Based on reviews of existing networks, predominantly Santa Monica's PEN, Cleveland's FreeNet, and Virginia's BEV, criteria for evaluating civic and community networks emerged. The criteria facilitated comparative discussion about the strengths and development needs of Cupertino's CityNet. The criteria suggested summarizing and comparing the following aspects of a network with existing models: purpose, vision, one-way or two-way communication choices, public access, opportunities for public discussion, opportunities for civic participation, system architecture, capacity, content, training, ownership, editorial control, financing, on-going funding sources, volunteer and paid staffing, plans for technology upgrades, and how well expectations of subscribers were met. In addition, Anderson et al. (1995) recommended adding the evaluation criteria of access to government, access to city forms and applications, direct communication with elected officials, sense of community, public library access,

computer literacy, and development of marketable skills for future studies of community and civic networks.

CHAPTER III

METHOD

Overview

This study examined how and why a panel of 22 CityNet subscribers used community network communications. According to researchers (Beamish, 1995; Molz, 1994), previous community network studies primarily cataloged policy-making aspects of network development. Little research existed on the community network subscriber who used the network. Therefore, this study sought to fill a void in the literature by applying a community attachment framework to examine how and why a panel of subscribers used CityNet.

The researcher evaluated how well the community attachment framework and traditional measures of community ties, levels of community involvement, and affiliation with the community applied to an electronic community network. The case study explored new ground by extending the traditionally newspaper-oriented community attachment framework to a local network. In addition, the study examined what meaning panelists derived from on-line experiences in a local setting. Personal, face-to-face, tape recorded, in-depth interviews were conducted with twenty-two panelists between July 10, 1995, and August 5, 1995, and with seven CityNet volunteers and city employees. Additionally, grant proposals, on-line documentation, training handouts, and newspaper clippings were reviewed for the study. This resulted in a triangulation in the data gathering. Since data gathering methods were qualitative user characteristics of those

studied cannot be generalized to the population at large, or to any sample of the population. Any remarks attributed to this group of CityNet panelists can only describe usage patterns of study participants.

Levels of Analysis

McLaughlin and Rafaeli (1994) found that a communications network was in many ways a global oasis for scholarly study with opportunities to do research at the intrapersonal, interpersonal, panel, and societal levels of analysis. In addition, documents related to CityNet's development, phase one interviews with CityNet volunteers and Cupertino employees, phase two interviews with twenty-two CityNet subscribers, and a comparison of CityNet and key community networks offered a way to triangulate the research data. These multiple data points and perspectives documented evidence of CityNet's development, provided verbal accounts of the networks' development process, and offered the panelists' perspective on CityNet.

For an intrapersonal perspective, subscriber's were asked about feelings and reactions to experiences with CityNet, and were asked for a self-measure of closeness or affinity to the community. For an interpersonal perspective, panelists were asked to describe in which instances electronic mail, face-to-face, fax, U.S. mail, or telephone communications would be preferred and why. A societal perspective was gathered by comparing community attachments of current CityNet panelists with the traditional ties to community found in previous newspaper readership studies.

CityNet Selected as Focus for Study

CityNet was selected for study because it was an isolated subnetwork host. This meant subscribers could send and receive electronic mail, but the network was invisible to non-subscribers. Since CityNet required subscribers to use an authentic name, this community network also provided a sample of people who were willing to be identified to others. This differed from commercial models such as America On Line where fictitious names were often used. Moreover it was selected as a stable example of a fully operational community network that did not receive government funding. The aspect of community and local users was key to the study and application of a community attachment framework.

Similar to a newspaper subscription, each network user had to subscribe to the network for community news and information resource. Only isolated academic, corporate, and other institutional networks were covered in previous research. Finally, although community and civic networks were covered in the literature, CityNet was overlooked in the academic literature because existing survey studies focused only on networks visible on the World Wide Web.

The unique characteristics of Cupertino and its residents were a final consideration for delving into the study. Cupertino is a bedroom community for many high-technology industry employees. It appeared to provide an ideal study environment with the potential for tapping into a highly computer-literate population. Therefore, CityNet was studied for

its potential contribution to understanding community network subscribers and to determine if a community attachment framework could be applied to a network.

The researcher gathered data from CityNet volunteers, City of Cupertino employees, CityNet subscribers, and CityNet documents. Interviews with the following seven CityNet volunteers and city employees were completed in phase one of the research: Wally Dean, CityNet Chief Executive Officer; Chuck Thompson, CityNet Systems Administrator; Carl Brown, U.S. Postal Service Information Technology Specialist; Thomas Quilty, Santa Clara County Sheriff's Office Information Technology Specialist; Bert Viscovich, City of Cupertino Public Works Manager; Vera Gil, City of Cupertino City Planner; and Donna Krey, City of Cupertino Public Affairs Manager.

In the next phase of interviews, 22 face-to-face, audiotaped interviews were conducted with individual CityNet subscribers who volunteered for the study. A community attachment interview instrument, pre-tested in prior community attachment studies of newspaper readers, was modified for this study. The original interview instrument was used in newspaper readership studies (Stamm & Fortini-Campbell, 1981) sponsored by the American Newspaper Publisher's Association in Seattle, WA. The modified interview instrument now asked about the community where the respondent lived, asked for a self-measure of closeness to community, asked about the panelist's top community concerns, asked about media-use habits, and specifically asked about CityNet use for community news and information.

After using the modified interview guide for phase one interviews, additional modifications were needed to clarify confusing items. In addition, a few items were added to help determine the level of computer expertise, and to more precisely define when and why various communications options would be used. As a result, the following sections were added to the phase two interview instrument for the 22 panelists: CityNet and electronic mail use, computer use and computer access, and a section on CityNet ownership and content control.

The interview instrument for CityNet panelists probed the individual's community identification, involvement, and computer use. The interview instrument and introductory letter can be found in Appendix A and Appendix B. The interview instrument was organized into six sections: the community of residence; newspaper, radio, Cupertino cable television, and television use; computer ownership and access from home; CityNet and electronic mail use; CityNet ownership and control; and CityNet subscriber demographics.

Items within the first section, community of residence, were designed to probe community ties through perceptions, memberships, affiliations, and community news gathering methods. In addition, community ties were examined with items about an individual's level of involvement (Stamm & Fortini-Campbell, 1981), and the frequency with which a panelist kept up with what was happening in the community. For the work-life balance question raised by Janowitz (1967), items were added to determine if the community network might be a communications device that made it easier to balance

work, life, and home tasks. Three questions were added to determine whether CityNet eliminated around town travel, served as a means of linking people to people, and offered a way to link people to information sources.

Another item, the self-measure of community identification developed by Stamm and Fortini-Campbell (1981) proved essential in arriving at an intrapersonal measure of community ties. The panelist was asked to look at a circle drawn on a piece of paper, then asked to visualize the circle as the community, and the panelist was asked to draw an x to represent closeness to the community. An x marked outside the circle, or just inside the circle would signify fewer community ties than an x marked in the center or close to the center of the circle. An example of the visual placed in front of panelists is located in the interview guide in Appendix A.

Selection of CityNet Study Panelists

The names of panelists emerged from the researcher's on-line request for study participants. Special permission was obtained from CityNet's Chief Executive Officer and System Administrator to post an announcement about the study on-line. Initially, a pop-up window announcing the study would greet subscribers at the time of log-on, then the subscriber could respond or delete and continue. The message encouraged interested subscribers to respond on-line. The pop-up window first appeared on June 19, 1995, and a subscriber would see it only once. The subscriber could choose to ignore the message or could reply and volunteer. Of the 34 on-line responses, 22 subscribers were available for interviews, and 7 CityNet volunteers and City of Cupertino employees were available

for interviews. Securing phone numbers, interview times, and an interview site for each of the twenty-two panelists and seven background interviews took approximately two weeks, and in some instances it took nearly four weeks for a panelist to be available for an interview.

To adhere to San Jose State University's Human Subjects Research approval process, each panelist was advised that the interview would be confidential and tape recorded for further analysis. All interview subjects had to be 18 years of age or older to meet the San Jose State University Human Subjects Research approval process, and each was asked to sign a form confirming understanding of the study parameters. This age limited excluded interviews with CityNet users who were under the age of 18.

Of the 29 interviews conducted, 10 interviews were conducted in a conference room at Cupertino's Quinlan Community Center, 8 were conducted in panelists' homes, 9 were conducted at panelists' work sites, and 2 were conducted at the CityNet offices.

Interviews lasted up to one and one half hours. All scheduled interviews were held, there were no cancellations. Panelists appeared to be talkative and willing to share personal experiences about CityNet.

A Profile of CityNet Panelists

To better understand the make-up of the CityNet volunteers, City of Cupertino employees, and CityNet panelists, some background on education and professions is provided. Of the 29 interviews conducted with CityNet panelists and CityNet volunteers and Cupertino city employees, 27 had college degrees and 14 had advanced degrees. In

terms of profession, 10 were in various business professions; 6 were active or retired from engineering or research and development; 6 were active or retired from teaching and educational administration; 5 were government employees; 1 was a machinist in computer-aided-design, and the last panelist was a full-time community college student. The panelists, network staff, and city employees were predominantly male, 19 were male and 10 were female. The panelists' ranged in age from 20 to 60 plus years, 19 panelists were 50 years of age or older, and 10 panelists were 20 to 49 years old.

CHAPTER IV

RESULTS

Overview

The results are organized according to major findings, CityNet's development, and according to each of the five research questions. The research questions are the framework for the discussions in the following sections: community ties of CityNet subscribers, reasons for using CityNet: levels of community involvement, reasons for using CityNet: accomplishments on-line, meaning of CityNet use: social context, meaning of CityNet use: varied interpersonal value, comparing CityNet with existing community networks, understanding CityNet's system architecture, and community attachment applied to a community network. The following findings emerged from the research and although not tied directly to the original research questions provide some critical factors relevant to community network use. The sections covering the additional findings are: finding out about CityNet, ownership and editorial control, funding a community network, community network user training, public access to government and civic forums, satisfying escalating user expectations, and CityNet panelist's recommendations.

Community attachment provided a framework for analyzing the reasons for using CityNet according to levels of community involvement. Panelist's reasons for using CityNet are organized according to the five levels of involvement detailed in the

community attachment literature: attending, orienting, agreeing, connecting, and manipulating (Stamm & Fortini-Campbell, 1983; 1981; Stephens, 1978).

Although many interview comments explained the meaning that panelists found in their CityNet experience, the most surprising results about meaning came from items related to social context of varied electronic communication modes, and in comments related to deciphering emotional content of on-line messages.

Major Findings

CityNet provided a way to access local information, so as to stay in communication with people and events taking place in the local community. For panelists who were retirees, college students, or self-employed, CityNet was the most affordable electronic mail service for home use. CityNet was also considered an economical alternative to the telephone, fax, and other on-line services for meeting communication needs. CityNet was designed by volunteers to serve non-technical users of all ages. It provided a non-intrusive medium for teacher-to-parent, teacher-to-student, resident-to-city hall, and neighbor-to-neighbor communications. When asked about CityNet use, panelists repeatedly mentioned having a "familiarity and comfort with CityNet's easy-to-follow graphics." Several female subscribers noted: "CityNet satisfies my needs for locally-oriented information." One subscriber liked the safety of "controlled access" that ensured she would not run up a high Internet use bill.

CityNet subscribers are allotted one hour of on-line use daily. Within this hour an individual can send mail, browse special conferences, chat with other CityNet

subscribers, access information from various discussion groups, and connect to external databases. CityNet connected 800 subscriber families to city, community, and Internet resources. Although subscribers are required to log on with a real name, an individual's usage remains confidential. The barriers to CityNet use uncovered in the study were computer access, computer literacy, keyboarding skills, and lack of a critical mass of subscribers.

A surprising study outcome was the mention by every panelist of daily CityNet use. The evidence of a daily CityNet habit was similar to a daily newspaper reading habit. Panelists log on at different times during the day. Retired panelists would log on during the morning, while working panelists would log on in the evening, and several single parents would log on late into the evening. This daily use behavior parallels earlier research linking community attachment and daily newspaper readership (Lind & Zmud, 1995).

Another interesting finding was the expectation around timeliness of response to electronic mail messages. Panelists were not interested in communicating with people who did not reply quickly and did not check electronic mail daily. Although panelists understood that a person might be unresponsive while away on vacation or business, they would terminate the on-line relationship if the communication was not reciprocal.

CityNet's Development

Wally Dean (1995) co-developed CityNet to fill an information gap:

The initial reason I did it [CityNet] was the fallacy that we are living here in the heart of the Silicon Valley with companies creating technologies for the world. I

looked at what we had available to us in the community and in the education sector and saw nothing. The concept originated when my son applied to Harvard. He bombed. I believed we needed a way for kids to study . . . a way to be networked together. That was the basis for CityNet.

Although located in the heart of the Silicon Valley, the panelists demonstrated less computer access from home than predicted. Originally, CityNet plans included bringing all schools and teachers on-line. However, as Dean explained: "The schools dragged their feet. Teachers complained about access, limited training, and time required to use electronic mail during hectic school days. So, the expected subscriptions did not grow as anticipated." Furthermore, the expected high conversion rate to CityNet by residents did not materialize although Cupertino had a large population of engineering and computer professionals (Dean). Dean also noted that CityNet differed from commercial networks by offering distinctly local content:

CityNet is completely different from AOL [America On-Line]. You can walk into your businesses and schools locally. You can't do it with the Internet. It's the bottom layer here, the layer that affects you personally, and it is value-added at the personal level. I tried AOL and got bored . . . looked for the draw, what was working, evaluated the product, and came up with our own.

Cupertino's CityNet delivers on the vision of community networking, but the barrier of computer literacy is great according to City of Cupertino Planner Vera Gil (1995):

Awareness of CityNet is high. But, if you don't own a computer you won't be on-line. Computers are not in the majority of homes of older families, and retirees without computer access . . . CityNet needs to reach out more with kiosks in the library, at city hall . . . we need more public access points.

Other unexpected benefits of CityNet were the partnerships created among students, city employees, and adult volunteers. City of Cupertino Public Information Director Donna Krey (1995) discovered an interesting collaboration:

Most civic and community networks offer a range of governmental and broad-based community information services; CityNet offers these services and U.S. Postal Service access:

CityNet is unique. It is the first network in the nation to offer direct electronic communications with the U.S. Postal Service. It took nine months to work out the legal program bugs and approvals so residents can send stamp orders, request vacation holds on mail, and notify the postal service of address changes electronically. Now other cities are planning to go on-line with similar services. Usage is higher than expected, so I have to log on more frequently. (Brown, 1995)

From the postal service to special interest groups, ease of use was a recurring theme.

Thomas Quilty (1995) with the Santa Clara County Sheriff's office and moderator of CityNet's crime forum noted:

CityNet provides direct access. It's easily accessible, integrated, and ties together well. It uses graphics and sound, and it runs on either DOS or Mac. The crime report covers incidents all over Cupertino for crime prevention purposes. The forum gives residents a way to speak directly with their law enforcement agency.

Cupertino's CityNet provides an affordable service by limiting Internet access to electronic mail only. CityNet's Systems Administrator Chuck Thompson explained how it works:

This access [electronic mail] is done in a batch mode. All of the outgoing mail is picked up every 20 minutes and sent as a group. The Internet collects all CityNet incoming mail and delivers it as a group . . . full Internet access would require a channel in the First Class software that would allow pass through to the Internet. This would require a high-speed connection costing \$20 a month rather than CityNet's \$40 a year.

Community Ties of CityNet Subscribers

Panelists mirror World Wide Web user demographics (Plotkinoff, 1995) in education and gender, but not age. CityNet panelists are older than World Wide Web users. Key

Community Ties of CityNet Subscribers

Panelists mirror World Wide Web user demographics (Plotkinoff, 1995) in education and gender, but not age. CityNet panelists are older than World Wide Web users. Key demographics from previous community ties research (Stamm, 1985) consistently characterized local newspaper readers as married, homeowners, parents, and as long-term residents with no plans of leaving the area. The demographics and broader aspects of community attachment found in previous research held, to a large extent, for CityNet panelists. For example, of the 22 panelists, 18 were married, 18 had children, 20 were homeowners, and 17 panelists were long-term residents of Cupertino living in the same residence for 11 to 30 years.

Community attachment ties were found in other areas too. Of the 22 panelists, all identified Cupertino as home, all panelists shopped in Cupertino, 21 would be sorry to leave Cupertino, and only 2 were considering moving away. Panelists were also asked to self-identify closeness to community. Panelists viewed a circle drawn on a piece of paper and placed an x to represent affiliation with Cupertino. Most panelists placed the x in the exact center of the circle or just off center but within the circle. Furthermore, 17 panelists noted 1 or more community leadership affiliations within social, educational, political, or business organizations.

Although there was considerable evidence of community attachment among CityNet panelists, the variables of church attendance and neighborliness did not hold. For

example, panelists did not attend church in Cupertino, and more than half did not attend any church. There was little evidence of neighborliness such as socializing with neighbors, scheduling block parties, or involvement between families. Three of the twenty-two panelists expressed a closeness to neighbors through social gatherings such as block parties, holiday open houses, and dinner dates. These panelists also held keys to neighbors' homes for security purposes, kept an eye on the other neighbor's house, and traded pet sitting over vacation periods. Neighborliness was limited to: "We talk while taking the garbage out . . . or wave when driving by one another."

There was little evidence of the community ties related to adult friends living in Cupertino, number of relatives living in Cupertino, and the sense of belonging to Cupertino. Only three panelists had 10-15% of their adult friends living in the city; only three panelists had relatives living in Cupertino; and twelve panelists identified other cities when asked to name the South Bay city most preferred if they could live anywhere. These differences could represent major societal and economic shifts since the original development of the community attachment framework. In addition, differences in regional economies may have made it prohibitive for family members to live near or in Cupertino.

Reasons for Using CityNet: Levels of Community Involvement

CityNet panelists approached on-line communications as a tool for personal correspondence, for business, for volunteer work, and for civic tasks. Individual users viewed CityNet as an ancillary method of communication to augment face-to-face and

telephone interactions. One panelist noted: "CityNet does not replace face-to-face communications. I still prefer the idea that E-mail links people to information not people. And I like to meet people early on to establish the relationship first."

Of the 22 panelists who were asked how their community involvement had changed since using CityNet, 11 identified themselves as more involved, 8 noted the same level of involvement, 2 noted decreased involvement in community, and 1 panelist had no response to the question.

Of the five possible levels of involvement (Stamm & Fortini-Campbell, 1983; 1981; Stephens, 1978), there was evidence of CityNet panelists using the network on attending, connecting, and manipulating levels of involvement. But there was little evidence of CityNet use at the orienting or agreeing levels of involvement.

Attending Levels of Involvement

Panelists demonstrated attending by being aware of community processes and staying informed about community activities. Examples of attending were accessing minutes, reviewing on-line agendas for city council meetings, and reviewing various city committee minutes. Generally, panelists were disappointed in CityNet's public information areas, because few subscribers were contributing to the on-line discussion. To keep up with information related to Cupertino, panelists relied on informal communications with Cupertino city officials and reading the local newspapers: *CityScene*, *Cupertino Courier*, and the *San Jose Mercury News*. One panelist noted: "CityNet is a major connection for local information. I also read the *Mercury News* and

use other on-line services for information." Another panelist used multiple sources of community information to attend to community concerns:

I read the *Cupertino Courier* Letters to the Editor, city council minutes, and invitations to city events to keep up with issues, concerns, and social activities. I also read any items in Speak-Up on CityNet. Citizens are very honest, even more honest on-line with CityNet than in person.

A retired panelist with a technical background used CityNet to seek information: "I use it so I don't bother people at work. I'm not a gregarious person and I don't just talk to amuse myself. I use network time for technical information, software, and genealogy searches." A special-education teacher went on-line for resources using: "Mostly the native plants, ponds, gardening, and animal discussion groups. I might ask a question for example, about the best type of toads for ponds. It's a great resource for environmental exploration with students."

Orienting Levels of Involvement

Distinguishing where the community stood on issues was evidenced by this panelist: "I use it for commission news, bicycle and pedestrian advisory committee minutes, and to read city council reports." Also, a city employee noted how the public Speak-Up forum on CityNet provided a quick means of checking public sentiment on emerging community issues. And another panelist found electronic access preferable to face-to-face communication:

I don't attend city council meetings . . . don't have the patience with tedious community participation events where you have to listen to everyone . . . even unintelligent input . . . it's cumbersome. For more background, I check under government and senior center for Cupertino local news and event coverage.

With the exception of these mentions and a few references to checking agendas or minutes, there was little evidence of CityNet use on the orienting level of involvement. Few people were using CityNet to determine where the community stood on local issues.

Agreeing Levels of Involvement

There were no specific examples of agreeing levels of involvement. Panelists did not mention using CityNet to relate to and agree with community issues. The Speak-Up forum offers opportunities for this, but panelists perceived that the same people communicated with one another on Speak-Up rather than through personal messages. Agreeing may take place in one-on-one interactive chat. But the panelists who might use the rapid interactive chat area mentioned not being able to find comparable keyboarding-skilled chat partners. During an election, several panelists mentioned that there were more postings to read on Speak-Up, but said it was not the lively discussion area they had expected. Even the few panelists who frequented Speak-Up noted how few CityNet subscribers participated in live chats.

Connecting Levels of Involvement

The primary reason most CityNet panelists used the community network was for connecting purposes. Connecting means talking to others in the community, listening to others, supporting others, and gathering with others for special interest purposes. A panelist who was a parent, genealogist, and full-time caregiver for a terminally-ill husband noted connecting uses of CityNet:

I hate to say this but I am an E-mail snob. If you don't have E-mail you don't hear from me except in the case of my elderly father and aunt in New York. They do get

phone calls regularly. I use E-mail to keep in touch with a friend in Australia, a daughter away at graduate school in Texas, friends here in Cupertino and Sunnyvale, cancer support group friends, cousins who are on-line, and a host of fellow genealogists.

Evidence for involvement at the connecting level was abundant. CityNet was used for hobbies, for professional networking, and for maintaining relationships. A panelist noted: "E-mail helps me to maintain professional relationships, to chat with college friends, and to talk to cousins for family history research." A teacher used CityNet as the sole means of maintaining a peer relationship with a teacher she met during a recent teaching conference. Panelists mentioned benefits from CityNet electronic communications such as the ability to log on at any hour without disrupting people, and the ability to interact on-line with local citizens. Another teacher found:

CityNet is a useful tool for kids . . . My own kids are in Cupertino schools so I helped bring the John Muir school on-line . . . I put homework on-line for my students . . . I stop and talk to high school students using the interactive chat feature . . . E-mail is easier to use than the phone . . . I can send messages in the middle of the night, know they will get there, and not disturb anyone.

Another example of connecting were the mentioned of panelists' using CityNet to accomplish collaborative projects. An educator and single parent with multiple commitments found:

It's [CityNet] an easy way to commute without getting into a car. It is good for parent-teacher collaborative work like doing a PTA budget on-line. I bounce through CityNet quickly, scan schools, city council, high schools, resources for local news, and events. Then I take care of a personal business on-line and keep in touch with friends, and business associates late into the evening.

Connecting to family members was a recurring reason for using CityNet although the family members did not typically live in Cupertino. CityNet was the sole electronic mail

connection for half of the panelists. A part-time city employee and active community volunteer used CityNet to stay in touch with family:

I E-mail to friends in Italy and Hungary . . . heard from my husband a marine geologist while he was stationed at the North Pole for research purposes . . . we could not call him or E-mail him but at least we could hear from him . . . I also review job listings on-line, talk to church members, and regularly keep in touch with both my daughters who are out of the area at school.

Using CityNet for business and civic purposes appeared to have unique benefits for an independent business consultant:

I like the silent delivery of E-mail for non-critical communications . . . I can disseminate a message to a large group. . . E-mail is like a paper brain, it provides a hard copy reminder, and it helps me keep up-to-date on community issues.

So, CityNet met a wide range of work, family, and professional needs. The one college-age panelist implied that CityNet was a link to others:

Cupertino people are older . . . there is not much of a college community here . . . the school is a commuter school . . . no sense of social community . . . actually it's pretty lonely here so I go to Los Gatos to look for people my age. I like CityNet, it feels like a close community . . . use it to keep in touch with high school friends who are away at college, and I write to a cousin-in-law in Hungary.

Electronic mail through CityNet enabled another subscriber to: "Keep in touch with my sister who lives in Southern California. And, once a week I contact my son who is away at college on the East Coast . . . I use it for brief and frequent communications."

Connecting to people using CityNet was evidenced in descriptions of contacts with friends, immediate family, extended family, school chums, and other CityNet subscribers who are active in the community.

Manipulating Levels of Involvement

CityNet panelists demonstrated examples of manipulation, the final level of involvement, by working for change on specific civic action projects. Each change project mentioned involved several city organizations and varied widely in scope. Working for change required a higher level of commitment than involvement at the attending, orienting, agreeing, or connecting levels. Typically a personal experience led to the panelist becoming involved with or leading a community action project. It was noteworthy that CityNet was not mentioned as an integral factor in completing the projects. Most of the community action projects had successful outcomes and were no longer active community issues.

Panelists worked for change on a variety of projects such as land use, transit needs, and safety concerns. In Cupertino, the importance of affordable housing and green space were noted: "Cupertino citizens have a lot of issues with long-term city planning. They want a greenbelt but need affordable housing . . . residents fear low income, and high density housing." Growth was important to another panelist who actively followed land use agenda items for the planning commission:

I started an organization to stop growth, and was specifically involved with preventing the controversial development plans for the sale of the Catholic Diocese land here in Cupertino. We've spoken at city council meetings and to other groups around the city because we don't want to see dense housing on those hills.

A panelist who was a teacher and parent of three noted:

I was active in getting a sidewalk put in on Bubb Road at the railroad crossing after my sixth-grade son was hit by a motorcycle. He was walking his bicycle and tried to jump out of the way. But he was hit by the motorcycle. He is fine today. But I worked hard to get that sidewalk put in.

Another panelist concerned about wheelchairs sharing the same lane with traffic near the community college led a successful change effort:

I've worked with emergency preparedness for some time, and most recently have been working to get wheelchair safety near De Anza College addressed. Wheelchairs currently share the bike lane with bicycles, people, and, at times, cars because there are no sidewalks. As an avid cyclist, and Bicycle and Pedestrian Committee member, I've also worked on the coordination of signals through Public Works.

In summary, the evidence supported CityNet panelists' community involvement on attending, connecting, and manipulating levels, but there was less evidence of panelists being involved on orienting and agreeing levels.

Reasons for Using CityNet: Accomplishments On-Line

Panelists' descriptions of activities accomplished with CityNet fell into five categories: handle correspondence, maintain relationships, manage communications, access information, communicate with a child's teacher, or communicate with other parents. CityNet's electronic access to city forms and applications was mentioned as a time saver by many panelists.

Asking panelists when various communication methods were most appropriate pointed out that CityNet's electronic mail was used for timely, cost-effective, non-intrusive, and efficient handling of non-urgent communications. Responses on when to use each communication mode were quite detailed. Panelists provided explanations and reasoning about when to use electronic mail, fax, telephone, U.S. mail, or face-to-face communication options. Panelists based choice of communication option on

whether it would support or detract from understanding the emotional content of a message. For example, one panelist noted: "I use it [electronic mail] when communication isn't urgent and for complex issues. I can write it, look at it, and change it."

This same panelist would fax a diagram or visual for discussion to improve the understanding of a plan, model, concept, or relationships. Telephone calls were used when an urgent reply was needed or when conflict was involved. Face-to-face contact was used primarily to enhance highly-emotional messages and for initial relationship-building. Finally, the U.S. mail was used as a last resort by CityNet panelists, or when a hard copy signature was required for a legal document.

There were specific plans about when to use each mode of communication according to one panelist who noted:

I use E-mail when there is no immediate imperative to talk to someone. But I use the phone for more local communications . . . use face-to-face for closing a deal, or when a signature is needed, or in confrontational situations when I want to watch the nonverbal.

Although not directly relevant to identifying community ties, responses regarding when to use each communication mode provided perspective on interpersonal communications over a computer-mediated network.

Interactive Chat Capabilities

Interactive chat on CityNet enables a subscriber to invite another on-line user to engage in a real-time electronic conversation. A CityNet chat involves two people. One sends a short line of text while the other waits to receive the message. Then the recipient

Interactive chat on CityNet enables a subscriber to invite another on-line user to engage in a real-time electronic conversation. A CityNet chat involves two people. One sends a short line of text while the other waits to receive the message. Then the recipient composes a return message and sends it. Chat proved to be too cumbersome for most panelists. CityNet users knew the real name of their interactive chat partner; this differs from most commercial chat rooms where people remain anonymous.

Interactive chat on CityNet had some constraints. According to panelists, the actual sharing of content was minimal, the timing was awkward, and the results were not very satisfying. This feature is one of the least liked by adults and, according to teachers on the panel, was the CityNet feature most enjoyed by students.

Comments related to chat capability appeared quite negative such as: "Chat is awkward . . . like international phone call delays used to be. Also, my keyboarding skills are faster than most people so they can't keep up." Another panelist also had typing speed frustration: "Chat is intrusive and frustrating . . . unless the typist is similarly skilled. I'm solicited all the time for chat but do not engage in it." Panelists using chat expressed similar experiences: "The phone is faster than live chat. It's not easy to carry on and it's not exciting."

The fast turnaround time was another complaint about interactive chat; there was not enough time to compose thoughts. Panelists also mentioned not having time to waste chatting with strangers, and many did not know how chat worked. Among the panelists, teachers used the chat mode with high school and elementary students. Teachers

commented on how surprise students were when an adult replied to an invitation to chat on CityNet.

Meaning of CityNet Use: Social Context

Electronic messages revealed some aspects of social context and emotion, according to panelists. Although there was no face-to-face encounter, most panelists looked at language, words, colors, sarcasm, and punctuation to understand the sender's emotional intentions. Detecting emotions on-line was not a skill professed by panelists. Beyond word choice, capitalization, and punctuation, most respondents could not easily read emotions in electronic mail. A panelist recalled interpretation difficulty: "It is not always that clear. Some people and cultures are very indirect. You have to be good at reading between the lines. Sometimes the person is clear . . . screaming in all caps." Words combined with punctuation encoded this panelist's messages:

I am very expressive. When I type something to someone who has made a great genealogy find I type GREAT!!! I don't like emoticons . . . maybe I'm a snob but when I see someone taking up space with smiley faces I think it's a waster. I'm a straight data person. Give me the facts, just the facts.

Another panelist looked at the choice of words for emotional cues and also noted a difference between age groups in communication patterns:

I look for the words they choose, speed with which they respond, and emoticons. If you check the teen and school forums they seem to be faster to flame. I see a dramatic difference between the way adults and kids talk to each other on-line. Some people are very brazen in person and will be on-line.

There was widespread agreement among panelists that initial face-to-face encounters helped alleviate confusion in subsequent electronic communication. The more a panelist

CityNet as an ancillary communications medium to augment face-to-face and telephone interactions. CityNet was not the preferred method for all communications: "[It] does not replace face-to-face communication. I still prefer the idea that E-mail links people to information, not people. And I like to meet people early on to establish a relationship."

Meaning of CityNet Use: Varied Interpersonal Value

CityNet's electronic mail fills a need for rapid transmission of interpersonal and relationship-oriented communications. Electronic mail also has the added benefits of permanency, and it bypasses barriers of time and place. Although a telephone message has permanence if recorded, electronic mail provides an easy record according to several panelists. Furthermore, CityNet electronic mail facilitates the accomplishment of various personal and business tasks. For example:

I use it when not a lot of response is required . . . just a request for information . . . short messages . . . share information widely. . . quick reminder to people when I have no time to call or see them. I talk to my son away in college . . . use it to keep in touch.

Electronic mail on CityNet offers some distinct advantages from other communication options. One subscriber found that electronic mail: "Makes you more organized, more formal . . . you don't ramble . . . just say what you need to say in a reasonable manner. I still find face-to-face is the most sincere and revealing communication."

Electronic mail on CityNet also enhances communications by removing differences of geography: "I don't worry about time zones with E-mail. Just send it when I can and they read it when they can." And another panelist explained: "I don't worry when I send

an E-mail message to Europe . . . it's quicker, removes concerns about time and distance, and it still seems personal."

Some panelists' experiences with the interpersonal aspects of CityNet's electronic mail were not easily explained within a community attachment framework. For example:

I use E-mail when I need a hard copy record of a short note to staff . . . I use the phone for longer issues where there is complexity . . . or I need feedback or interaction. I use face-to-face for arguments, problem solving, or when visuals and decision-making are involved.

Panelists also accomplished civic, parental, educational, genealogy, and purely information-gathering tasks on-line. The meaning assigned to this experience was clearly personal, as personal as any conversation or letter sent to another person. At the same time, CityNet also provided a way to broadcast a message to a larger audience. The benefit of inexpensive daily electronic communications was positive, considered supportive of relationship-maintenance. The growth in civic and community networking use is visible in many communities. The emerging networks have many development paths to follow, but three networks served as models for comparing CityNet to existing civic and community networks.

Comparing CityNet With Existing Civic and Community Networks

A basic analysis criteria for civic and community networking models emerged from studies reported in the literature of the three key networks: Santa Monica's Public Electronic Network (PEN), Cleveland's FreeNet, and Virginia's Blacksburg Electronic Village (BEV). The criteria for examining CityNet included: vision, one-way or two-way communications, public access, public discussion forums, system architecture and

capacity, content, ownership, editorial control, funding, staffing, technology upgrade planning, and an ability to meet escalating user expectations (Beamish, 1995; Molz, 1994; Guthrie & Dutton, 1992).

Panelists typically paired CityNet's origins and vision with Wally Dean's name:

Wally talked about advancing community through technology, and this became the focus and slogan for CityNet. He [Wally] went to various community, school, corporate, and city council meetings with a mock-up version of CityNet to help people visualize the network.

CityNet was developed to encourage broad-based access to the Internet. CityNet is based on lofty principles according to one panelist: "It was pie in the sky . . . people and technology . . . government brought to the people with access for everyone." A panelist noted that the network was implemented because of the dedication of a single individual: "CityNet would have died without Wally [Dean]. Wally was interested in new technology and Robert Kim was the idea person initially. Kim left to pursue on-line government with Virtual Valley."

Understanding CityNet's System Architecture

Some significant features built into CityNet are access to local event and service news, local government news, and to local resumes of on-line subscribers. CityNet is limited in Internet access to electronic mail and pre-selected newsgroups. CityNet's two-way communication capabilities and interactive chat capabilities were unique compared with the key models discussed in the literature. A sender could distribute a message to one or thousands of electronic mail addresses. CityNet was designed as an

Some significant features built into CityNet are access to local event and service news, local government news, and to local resumes of on-line subscribers. CityNet is limited in Internet access to electronic mail and pre-selected newsgroups. CityNet's two-way communication capabilities and interactive chat capabilities were unique compared with the key models discussed in the literature. A sender could distribute a message to one or thousands of electronic mail addresses. CityNet was designed as an isolated subnetwork only available by subscription. One panelist did not find this isolation advantageous:

CityNet is isolated, it only has school information, and only serves Cupertino schools . . . it's too island like. I think Virtual Valley, Smart Valley, and city sites on the World Wide Web are the way to go . . . I would like to see the information integrated better with other cities, and systems . . . we live in Cupertino but we eat out, shop, and go to movies all over the Silicon Valley.

The number of users appeared small to CityNet panelists. Most estimated the subscriber base to be 500-600 people rather than the actual 800 subscribers. When a panelist could not offer an estimate, the dilemma was: "I'm not sure of the size . . . not a clue on the size of it . . . but we could not be anywhere near capacity because I never see more than a couple of people on-line when I am." In answering the interview question about how many people were on CityNet, some panelists estimated there could be 5,000 subscribers on the system, but most had no idea. One panelist who volunteered at CityNet estimated total capacity accurately at 10,000 subscribers. The notion of capacity prompted one panelist to discuss critical mass concerns with CityNet:

I believe there are 600 families subscribed and that's only 4-5% of Cupertino's population. And, according to communication research, you need to have at least

Major criticisms of FreeNets related to the inefficiency of FreePort, the software originally developed in the late 1980s for the Cleveland FreeNet. There were no problems raised by panelists about CityNet's First Class software. It appeared to be easy to use. This software was selected to avoid some of the problems encountered by FreeNets. Unlike most civic networks across the country, it permitted non-residents to subscribe if they worked, attended school, or volunteered in Cupertino.

Finding Out About CityNet

Key components to accessibility were learning that the network existed, finding out where to call to subscribe, connecting as a new subscriber, and learning to use CityNet's electronic mail capabilities. Panelists predominantly learned about CityNet's existence through local and regional newspapers. Other avenues for learning about CityNet were the city's newsletter, neighbors, friends who were elected officials, or watching a demonstration by Wally Dean at a public forum. One subscriber described multiple communication points: "I heard about it in the *Cupertino Courier*, *CityScene*, and in *San Jose Mercury News* articles, and I have a neighbor who is also on-line with CityNet."

However, several panelists said they had a hard time finding out about CityNet, because it was not well publicized. It was not possible to find literature about CityNet on the World Wide Web, at the local library, at schools, or in the local newspaper. One panelist noted: "I had to write a letter, make a phone call, and drop by the CityNet office when a volunteer would be available to get the registration packet and software."

Initially CityNet was publicized in local, regional, and national media. But when the local *Cupertino Courier* changed ownership, the new owners eliminated coverage of CityNet in favor of promoting the newspaper's own commercial network. In a search conducted on the World Wide Web for CityNet, Cupertino's CityNet did not appear. An on-line search led to the commercial venture CityNet and to New Zealand's CityNet. The commercial CityNet provided a directory of all California cities on the World Wide Web, but there was no listing of any civic, community, or commercial network serving the City of Cupertino.

Several panelists recommended increasing the publicity about CityNet by placing more public relations materials on-line and at schools. The primary way of learning about CityNet appeared to be demonstrations and word-of-mouth, but study participants suggested augmenting this with a regular column in the city's newsletter. One panelist who was also a teacher recommended:

Mail students a packet or put the packet in the district office. Get information in front of people, in the libraries. People are not aware of how to get CityNet, or how to subscribe. And, they don't realize they can subscribe if they live outside of Cupertino.

Other panelists suggested: "Keep talking about it . . . place a handout on-line. Draft a blurb for use in every school and community organization's newsletter. Share flyers with parent-faculty organizations. Make presentations at schools and school conferences again."

CityNet was advised to do some research to differentiate itself: "People have to perceive some value. CityNet needs to understand what people want, and what they are

doing with CityNet, then they [CityNet] can focus limited resources into only those areas."

Ownership and Editorial Control

Protecting school-age children from pornography and bad language was a major concern for CityNet developers. One panelist described removing messages when moderating for profanity:

One of our users spent a lot of time looking through all the conferences for messages containing bad language. From this he identified the key offenders. Now, he periodically logs in, and uses the search function to find new messages with unacceptable language. Unacceptable language is loosely defined to be language you wouldn't want in front of a grade school class. When such a message is found, we do two things: delete the message and write the author here on CityNet . . . or write the systems administrator if the message arrived from another system.

Cleaning up the system and protecting children who might use CityNet were important to moderators volunteering at the family-oriented network. It was surprising to find that most panelists were unaware of any censorship taking place on CityNet. One noted:

There should not be censorship. I will talk to them about it . . . I'm not aware of censorship. As a newsgroup moderator, I know I can kill a file by an author, based on subject or words with a newsreader . . . so, I know that type of censorship is possible.

The majority of respondents knew CityNet was a non-profit organization: "CityNet is a non-profit run by volunteers and seeded [starting funds] by the City of Cupertino." Few realized that it was not started with city government funds, and only a few panelists were aware that a governing board of volunteers directed CityNet's development. Another panelist, who also served as a moderator noted: "People on the system define CityNet,

and they do so by requesting certain things, or saying, "hey, this is not what we want here.' "

Funding a Community Network

Clearly cost was a major differentiator between CityNet, a nonprofit provider, and commercial full Internet access providers. Panelists repeatedly noted how affordable electronic mail was through CityNet, although some panelists additionally subscribed to another on-line service such as America On Line, Prodigy, or CompuServe for full Internet access.

CityNet was predominantly funded by in-kind gifts and subscriptions. Early donations of equipment and network installation services were provided by corporate donors. Other donations included office space, several small grants, and personal contributions from those working closely with the network. Sustainable funding to pay for software licenses, insurance, and system upgrades continues to be an area of concern for the network (Dean, 1995; Thompson, 1995). Beyond seeking volunteer support, another subscriber recommended seeking sustainable and broader funding to keep the network active: "I'm concerned the network would collapse without Wally [Dean]."

Community Network User Training

Some panelists suggested that a quick reference manual would be helpful in training new subscribers. It took nearly two years for some panelists to discover how to address an electronic mail message so it could be sent outside of Cupertino. Another panelist noted:

Training is a problem, once you know how to use it, you're OK . . . you can't just develop a network and expect others to know how to use it automatically . . . I learned how to use the system because my son away at college taught me to send E-mail . . . I still don't know how to use the live chat . . . when someone invites me to chat, I don't know how to do it.

The major training needs were learning to address messages for delivery outside of CityNet, learning to set up CityNet on a PC platform, and learning to request new discussion groups. Another training problem appeared to be in upgrading to new versions of software; several panelists mentioned they were unable to upgrade to the latest version of CityNet software. Although the panelists had loaded the initial software to begin use of CityNet, some did not know how to download the latest version of the software from the system to upgrade to the latest version of CityNet. One study participant observed a: "Naiveté of the public on computers. Computers are not a panacea for all problems, only a tool. E-mail is underestimated, limited to banner carriers. There is a lot of missionary work to be done."

Panelists found telephone support helpful at CityNet: "This guy [Chuck Thompson] is dedicated . . . I just talk to virtual Chuck if I have any questions . . . Chuck is very responsive. He added conference access to forums on ponds and woodworking at our family's request."

Public Access to Government and Civic Forums

Most panelists sent electronic mail to fellow community board members, city council members, teachers, and others who are known to be on-line. One panelist used CityNet to share information with others, speak-out on politics, look at upcoming city council

agendas, and to stay informed without leaving home. For some, CityNet aided in sending local communications to others: "I'm on several school and community board of directors, and CityNet's E-mail helps me stay in touch, route minutes, and agendas, and communicate between formal meetings."

CityNet provided more direct connect opportunities than other community network. Citizens could reach city officials, city documents, and city council meetings electronically. One CityNet subscriber who had never met the Mayor of Cupertino found him quite responsive on-line: "I regularly E-mail Wally [Dean, Mayor in 1995] with issues or concerns and he replies." Also, Cupertino City Council members were encouraged to use CityNet on loaned laptop computers. Furthermore, CityNet offered public discussion through Free-for-All and Speak-Up forums.

Comparing Network Choices and Capabilities

Another model of community networking, the Blacksburg Electronic Village (BEV) ownership model appeared more robust than CityNet's. BEV has a three-way partnership with city government, a university, and a major telecommunications provider. BEV approached the plan for an electronic town hall by requiring Internet accessible wiring in all new structures, even in apartment buildings. CityNet did not have partners with this level of financial, political, or technical resources.

CityNet and BEV provide similar access to community, school, library and city government information. Where they differ is in BEV's focus on business; clearly CityNet did not have strong business representation. But BEV provides a test site for a

business to experiment with electronic delivery of products and services. In addition, BEV started as a World Wide Web accessible community network, it invited open access from outside the city. But CityNet was built as a closed network, isolated from the World Wide Web user.

CityNet and Santa Monica's Public Electronic Network (PEN) share a similar community focus because both networks are only visible to subscribers. Both networks were developed as an alternative method for people to access city information and to learn about computers. Sponsorship and funding from city government provided PEN with stable funding, while CityNet has struggled with grant writing to upgrade systems and services.

Some of PEN's major difficulties such as creating value to attract residents and overcoming poor adoption rates within some city departments are also issues for CityNet. But CityNet had the foresight to develop a system that permitted resident-to-resident, resident-to-Internet, and resident-to-city hall connections unlike PEN (Guthrie & Dutton, 1992).

Satisfying Escalating User Expectations

A fear of computer use among some teachers was mentioned by one panelist: "Students are so computer literate it's scary. Teachers are often afraid to use the technology . . . yet some teachers now using CityNet are trying to use all kinds of technology." The inability to access the full Internet and the World Wide Web was a major problem with CityNet, according to panelists who did not have access through

work or school. Also, panelists mentioned that content was not kept current in many areas, and wanted CityNet to keep school, government, and community site information current. Several panelists mentioned problems with weekend system failures and loss of messages on CityNet.

Most study participants were quite forgiving of CityNet's limitations. Expectations were not as high among panelists because it was a non-profit, community networking experiment. Overall satisfaction with CityNet was high, and one study participant's comment summarized typical user sentiment:

CityNet is very leading edge with live, on-line access to the city council during council meetings. Our CEO is currently mayor. We have interactive services not available on other networks including mailing a package through the U.S. Postal Service on-line. They pick up the packages at your door. CityNet also has wireless service so a city employee can log-in from anywhere in the city using a laptop computer during a disaster or for every day tasks.

Fifteen of the panelists rated CityNet with high or medium to high satisfaction on the interview instrument's visual chart (Appendix A), while eight panelists rated their CityNet satisfaction at medium, low to medium, and low levels on the chart. A single quote captures the local information that users found satisfying: "Wally brought so much to CityNet, interactive council meetings, the post office, cat licensing, building permits, a forum to talk about trash pick-up and yard waste." Although most offered suggestions for improvement, panelists overall were enthusiastic about Cupertino's CityNet.

Specific CityNet features that panelists liked were the low cost and one hour time limit, along with knowing who else was also on-line, and the use of real names.

CityNet Panelists' Recommendations

Panelist's recommended that CityNet continue to expand its reach and invite participation from the local community college, from all schools, from businesses, and from more citizens. The most frequently requested single improvement was to provide full Internet and World Wide Web access at a reasonable cost.

One problem noted by a panelist: "CityNet is an excellent community bulletin board for its limitations . . . after awhile though the novelty wears off." The aspect of unique and current local content was critical as evidenced by these responses: "Council minutes and agendas are not kept up-to-date . . . need more timely information . . . CityNet should keep content providers updating their content . . . Flint Center information has not changed in months."

Although there were recommendations from panelists to improve the system, most mentioned pride in CityNet taking such an innovative approach to improving computer and Internet literacy. CityNet filled a need by providing residents with electronic access to teachers, to family members, and to neighbors. In many instances, panelists were developing computer skills for the first time. In other cases, panelists retired from business or teaching careers found CityNet to be useful in keeping in touch with special interest groups, peers, and friends within the City and around the world.

CHAPTER V

DISCUSSION AND CONCLUSIONS

Overview

This discussion begins with a summary of findings including answers to the five research questions which is followed by a discussion of the findings, contributions to the literature, directions for future research, and the conclusion.

Summary of Findings

CityNet is an electronic town hall that has not quite arrived. The meeting rooms are there, the signs are in place, the wiring is in, the lights are on, but people are not congregating. CityNet charted new territory for community networking by offering a live connection to city council meetings, a direct link to the U.S. Post Office, and by offering a live interactive chat capability. Although these capabilities were available, CityNet panelists predominantly used the network as a source of community news.

Examples of using CityNet for local news and information were substantial. In addition, examples of panelists using CityNet to connect to others were numerous. Study panelists frequently mentioned checking city agendas, commission minutes, and the public Speak-Up forum for city issue news. Panelists also mentioned connecting with friends, family members, a child's teacher, and with city department heads on the network. Of Cupertino's 40,000 residents, 800 subscribe to CityNet. This network sustains itself in spite of funding, staffing, and commercial competition challenges.

Summing up, the study findings answered the research questions as follows:

(1) Who is using Cupertino's CityNet?

CityNet panelists are married, homeowners, and parents. They are older than typical World Wide Web users. Panelists consider Cupertino home and they would be sorry to move away from the community. The panelists studied also participate in one or more community leadership positions within athletic, social, educational, political, service, and business organizations.

(2) Why are CityNet subscribers using the network?

Panelists read local and regional newspapers daily, and log-on to CityNet daily as an additional source of local news and event information. Panelists used CityNet for corresponding, maintaining relationships, managing volunteer communication tasks, accessing information, and for communicating with a child's teachers. Subscribers use the network because it is familiar, local, inexpensive, and it provides a non-intrusive way to communicate with other electronic mail users. CityNet panelists used the network to accomplish communication transactions from home almost as easily as they used a bank's automated teller machine to conduct financial transactions.

CityNet panelists used the network for seeking information, developing or maintaining relationships, and accomplishing tasks supporting the categories of computer-mediated communications noted by December (1995).

(3) What meaning does an individual CityNet subscriber find in his or her on-line community networking experience?

CityNet satisfies a range of user needs from entertainment and information, to free software and family history research. Although CityNet is both an interpersonal and mass communications vehicle, panelists predominantly used it for interpersonal interactions.

(4) How does CityNet differ from other civic and community networks in the United States?

Cupertino's CityNet offers a live connection to city council meetings and a direct connection to city officials. Although CityNet offered more opportunities for interaction between local citizens and city hall than other key networks, few panelists used these forums. In fact several mentioned that the same subscriber's names are on the forums each time they look.

Several panelists mentioned having on-line interaction with students in junior high and high school; this aspect of community network use had not been discussed in the key studies of community networks in the literature. Furthermore, opportunities for youth volunteering emerged as students began to interact on-line with city employees and volunteers at CityNet.

CityNet did not avoid the funding, adequate volunteer staffing, and escalating user expectation problems found with other networks (Beamish, 1995). Training and HelpDesk functions were highly rated by CityNet panelists. Although written directions were available for solving configuration problems, panelists appreciated having CityNet's "virtual Chuck [Thompson]" help resolve access problems.

(5) How well does the community attachment framework apply to an electronic community network?

An individual panelist's community orientation was important but it did not have to be a city government orientation to be interested in using CityNet. An interest in keeping up with what was happening in school, community, and local government was the factor contributing to network use.

Research on community attachment has found a lot of affiliation and affective ties to the local community. The evidence supports robust ties between panelists and the City of Cupertino. Panelists exhibited multiple ties to the community, including membership and participation in varied organizations. Furthermore, panelists demonstrated community ties by attending monthly civic and community events. The panelists were also members of a wide range of civic and professional groups, but few mentioned participation at local churches. Finally, a majority of panelists demonstrated stability of residence.

Community Attachment Theoretical Framework

Community attachment and individual community ties were found to provide an organizing framework for profiling CityNet panelists although newspapers and networks do not provide identical types of information. Some similarities between the local newspaper and local network subscribers were found related to community ties, a habit of daily use, and the gathering of local news and information. A community attachment framework provided a consistent way to examine a panel of computer-mediated communication network users.

Relating community attachment to actual behaviors of panelists provided a stronger explanation of ties to the Cupertino community. Evidence of behavioral commitment to community increased the strength of attachment. Community ties such as length of residence, affiliation with community organizations, and attendance at city events were found among panelists. All of the ties associated with the community attachment framework except neighborliness and church participation appeared to apply to a community network (Edelstein & Larson 1960; Stephens 1978; Brown & Davis, 1978). Home ownership was somewhat problematic given the high cost of Cupertino housing, home ownership was actually prohibitive for several panelists who otherwise demonstrated ties to the community.

Comparing the use of an electronic community network to reading a community newspaper revealed obvious differences in cost, access, literacy, and portability. A newspaper reader spends a nominal fee, turns manually to content of interest, carries the newspaper easily, and needs to read only at an eighth-grade level. In comparison, the community-network user has a higher price of entry. Network use requires access to a computer, modem, and telephone line. The user has to learn enough about the technology to install software for the network and to hook up a modem. Also, the network user has to commit more time than a newspaper reader to searching for information. Initially, scanning a network for information could take longer than scanning a newspaper for information. So the information access process used with a newspaper and over a computer network were quite different.

One significant community tie mentioned in previous community attachment research, the tie to church, was absent from this study of CityNet panelists. In the past active participation in local church groups, not just church membership, was a strong indicator of community ties that motivated local newspaper readership. Only three CityNet panelists attended a local church or mentioned active participation in religious organizations. This was significant since church participation was described as the strongest predictor of local newspaper subscribing in prior research (Stamm, 1986).

Levels of Community Involvement

Panelists described themselves as feeling inside the community and as members of social groups within the community. Involvement in the community or in community groups contributed to individual panelist's number of community ties. It was mentioned by panelists when describing their identification with the community. There were considerable examples of panelist involvement at the attending, connecting, and manipulating levels of involvement (Stamm & Fortini-Campbell, 1981, 1983).

In terms of links to the community, CityNet panelists demonstrated the manipulating level of involvement with examples of leadership in community change activities. Panelists shared numerous examples of using CityNet at the connecting level, connecting to other subscribers, to friends, and to family members. There were also examples of attending levels of involvement, using CityNet to become aware of community issues.

Electronic Communications With New Capabilities

CityNet panelists described the use of the new capabilities of electronic media similar to findings by McMurdo (1995). Panelists were preparing, revising, and controlling the transmittal of messages thereby making a change from face-to-face and synchronous interpersonal communications. Electronic media offered opportunities for both mass and interpersonal communications (McLaughlin & Rafaeli, 1994) but CityNet panelists were primarily using it for information and interpersonal communications with others.

Study respondents described numerous uses of CityNet for one-to-one communications. Only a few panelists distributed communications to large audiences for community or school organizations. CityNet panelists primarily described communications at an interpersonal level of interaction: talking to a child's teacher, sending a message to a city official, and corresponding with a friend. There were also examples of panelists reviewing what was on-line solely for information purposes. And some panelists mentioned use at the impersonal level to download free software, access a database, or to request a document without having to interact with anyone.

There were also examples of parents using CityNet to communicate directly with teachers. The number of parents using CityNet to stay in touch with a child's teacher was a surprising finding. All panelists from the educational sector used CityNet to communicate with students, other teachers, and with parents. Although CityNet has not been widely adopted by educators, it provided a valuable, non-intrusive communication link for educators, students, and parents who were on-line.

Parents viewed this on-line interaction with a child's teacher to be more direct than leaving a telephone message, but not as direct as a face-to-face interaction. CityNet provided an informal setting for parent-teacher and teacher-student interactions. Informal communication with teachers and other parents was valued by working parents. Panelists valued CityNet, a complex computer network, for its simplicity, familiarity, and informality. This was an unexpected finding.

Discussion

Panelists predominantly used CityNet to gather information and support existing relationships. In addition, there were mentions of using CityNet to access free software, free fixes to software program bugs, and free access to conduct family history research. Low cost and immediacy of message delivery appeared to be major motivators for electronic mail use on CityNet. Panelists were not using electronic networks as a substitute for face-to-face communications, nor to replace newspaper reading. Although interpersonal interactions were central to descriptions of CityNet use by panelists, there was no evidence of panelists meeting new people, forming new relationships, or developing romantic interests.

The community integration framework is valuable for explaining community network use. The process of developing community ties represents changes in the individual or family relative to the community. It is hard to identify the most important indicators or even a hierarchy of indicators within the community attachment framework. Broader study implications are that a community attachment approach can help increase

understanding of why people use computer-mediated communications network for local news and information.

According to Janowitz (1967), the greater the community integration the greater the use of local newspapers. This was found with CityNet panelists. Community network users in this study exhibited high levels of community involvement, read multiple local newspapers, and used Cupertino's CityNet for news and information. Since Janowitz (1967) considered how a local newspaper was critical to the community integration process, a community network might also be critical for community integration within new electronic communities. Today, community integration may refer to physical communities within geographical boundaries. Tomorrow, community integration may refer to virtual, electronic communities. An electronic community network might even become an integration tool for people assimilating into new electronic communities at work, school, and home.

The use of a self-measure of closeness to the community, suggested by researchers (Stamm, 1985; Stamm & Fortini-Campbell, 1983), resulted in data about an individual panelist's intrapersonal feelings about closeness to the community. Asking panelists to self-identify proximity to community by placing an x in a circle representing Cupertino helped prompt additional discussion about community involvement, membership, and participation. This intrapersonal measure of community ties provided evidence of community attachment and augmented the behavioral evidence of community involvement.

This self-identification process designed for use in community newspaper readership surveys applied to a community network.

The interactive, correspondence-like aspects of a community network could not be fully addressed with the community attachment framework. Therefore, discussions on social context, interpersonal, and mass communications, and emotional cues provided a more complete perspective of community network use.

Panelists found CityNet's electronic mail less burdensome than other forms of interpersonal communication. CityNet was primarily a tool for local news and information, and secondarily a tool for personal communications. For working panelists, electronic communication was less burdensome for transacting interpersonal interactions than face-to-face or telephone communications.

Contributions to the Literature

The community attachment theoretical framework did not provide a clear hierarchy among community ties such as length of residence and home ownership for describing strength of community attachment. But the levels of involvement noted by Stamm & Fortini-Campbell (1981, 1983) provided a simple measure of community attachment intensity demonstrated by actual behavior such as manipulating or leading a community change project.

This study applied the early findings of Park (1926) and Janowitz (1967) related to newspaper readership, and furthered the research on community attachment summarized by Stamm (1986). Panelists used CityNet to augment other sources of community event

and local issue news. Granted, the participation on public forums about local issues was limited to a few, but CityNet still provided an interactive forum for discussion. This study builds a foundation for further research on electronic media in other settings.

Applying community attachment to CityNet represents the first adaptation of the framework to a new electronic media. Results of this study are relevant to those studying community networking, civic networking, and electronic democracy. And the study is relevant to those interested in developing a greater sense of community among network users. Creating and supporting a sense of community on-line is the next step toward improving personal and business electronic-relationship building.

Future applications of community attachment also need to consider societal changes in membership and regional economic factors. For example, the evidence for traditional community ties was present, but home ownership was somewhat problematic because only long-term residents or high-wage-earning families could afford to purchase a home in the City of Cupertino. Also, permanency of residence might differ today in a more mobile society. Furthermore, church attendance was not a tie highly represented among panelists, so future research applying a community attachment framework needs to evaluate the traditional ties relative to the current social and economic context.

Directions for Future Research

This study could be replicated in a number of community settings to increase the understanding of community network users. For example it could be replicated at a Parochial school where families, teachers, and students are all on-line. Both the sense of

community and the religious orientation or belief system might be more closely aligned to the earlier research that noted church ties.

Another valuable new direction would be replicating this study with a network in a Bible Belt community in the South where there would likely be church ties. A final direction for the study of church ties might be the study of a religious community on the World Wide Web with geographically dispersed membership. This would require some expansion on the definition of community, and additional definition of what would constitute a community tie in a geographically dispersed community.

Conclusions

Although individuals and organizations use a local network as a communications option that transcends barriers of time, distance, and geography citizens of Cupertino are primarily using CityNet for local news and personal correspondence. Once electronic mail moves from a luxury to a necessity and becomes as widely accessible as the telephone, community networks may give way to all commercial network models. Cupertino's CityNet provides a pilot test for bringing new electronic communications to both the haves and have-nots of the information superhighway. The doors to an electronic community are standing open, but subscribers are not flooding the network to capacity.

Imagine a community of the future. Citizens congregate in the electronic town hall, vote electronically, and debate local issues electronically. Citizens use a home computer or public access computer at the local coffee shop to talk to the mayor, a child's teacher,

or to list their home with the local real estate agent. This electronic community of the future is here today for some, but it is still a vision for those without computer access.

Although Cupertino is home to many computer and high-technology company employees, fears and misconceptions about computing have proven to be barriers preventing CityNet's growth. There is still much work to be done to increase awareness and public access, and to develop easier-to-use interfaces.

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Appendix A

CityNet Community Attachment Interview Guide

July 1995

Community Attachment/CityNet Interview Guide
CityNet, Interview Guide
July 1995
100 Items

Section I: The Community of Residence
Section II: Newspaper, Radio, Cable Tv And Tv Use
Section III: Computer Ownership/Access From Home
Section IV: Citynet & E-Mail Use
Section V: Citynet Ownership/Control
Section VI: Citynet Subscriber Demographics

Interview candidate _____
Home phone _____ Work phone _____
Date _____
Place _____
Length of interview _____
Follow-up availability _____
Email addresses _____
Notified of research rights... **HANDOUT!**

SECTION I: THE COMMUNITY OF RESIDENCE

Let's talk about the community where you live?

1. What do you call community?
2. When asked where you live would you name neighborhood

Community Attachments

3. How long have you lived in your present home?
4. How many moves have you made in your lifetime?
5. Are you contemplating a move?
6. How many times have you moved more than 50 miles from previous home?
7. How long did you live at your previous home?
8. Is Cupertino home or do you consider home to be another city, state or country?
9. Do you miss the place you consider to be home?
10. Do you miss the place you consider to be home enough to move back there?
11. Do you work in Cupertino? Employer: _____
12. Do you participate in social, cultural events in Cupertino? Frequency per mo. _____
13. Have children in school in Cupertino? Children have graduated
 Currently have ___ children in Cup schools
14. Do you attend church in Cupertino?
15. Do you shop in Cupertino?
16. Describe nature & time spent in neighborhood contacts - regular visiting with
 neighbors...Block parties ...?

17. What percent of adult friends live in Cupertino? 10% 20% --- 50% --100%

18. How many relatives and inlaws live in the Cupertino area? None, half or less.

VISUAL AID: SELF-MEASURE OF COMMUNITY IDENTIFICATION

19. Let me ask this question another way. Imagine that the circle in the handout represents Cupertino. Mark an "x" where you would put yourself in relation closeness and involvement with Cupertino.

20. Why this placement?

21. Do you have a sense of belonging to Cupertino?

22. If I had to move I would be sorry to leave Cupertino

23. If I could live anywhere in the South Bay I would chose Cupertino
(I haven't lived in Cupertino long enough to have established roots here.)

24. How did you first begin to feel like you belonged in _____?

Probe: What happened?

25. How do you keep up on City/community events/activities?

26. How do you offer ideas for improving this community?

27. How do you disagree with the way _____ is being developed?

28. How do you get together with people who know what's going on in _____?

29. How do you work to bring about changes in _____ community?

30. VISUAL AID: WHICH ARE YOUR TOP THREE CUPERTINO ISSUES?

- a. Quality of K-12 Education
- b. Libraries
- c. Land use/commerical development
- d. Diversity
- e. Affordable housing
- f. Community services
- g. Senior services
- h. Youth services
- i. Transportation
- j. Other

31. VISUAL AID: INVOLVEMENT WITH CUPERTINO COMMUNITY

High -- Medium-High -- Medium--Low-Medium--Low--Not applicable

What makes you respond this way?

32 How often do you do the following?

___ Do you attend city council meetings? What brings you do one?

___ Do you serve on city committee? How did this come about?

___ Do you hold city office currently? How did this come about?
Offices? Number of years?

___ Do you serve in a leadership role in citizenry or community group?
Which one, how did you learn about the group? Role and years?

SECTION II: NEWSPAPER, RADIO, CABLE TV and TV USE

33. When was the last time you read a newspaper?

34. Which papers do you read?

SJ Merc-News

SF Chronicle-Examiner

Peninsula Times

Cupertino Courier

Cupertino Scene newsletter

San Jose Metro

Los Altos Town Crier

SJ Business Journal

Wall Street Journal

35. Do you subscribe to or buy any weeklies, dailies?

36. If two or more newspapers...How do you happen to read more than one newspaper?

37. If you were going to take only one of these papers which one would you keep? Why?

38. Where on CityNet do you look for Cupertino local news and event coverage?

TELEVISION

39. About how many hours do you watch TV weekly?

40. Which type of shows? Entertainment, news or information?

a. Does this mean that you watch TV primarily for entertainment?

b. Or for news and information?

c. Or for a mix of all of the above?

CUPERTINO CABLE CHANNEL

41. Do you watch Cupertino Cable TV?

42. How many hours a week do you watch Cupertino Cable?

43. Which programs do you watch?

RADIO

44. Which station(s) do you listen to in the car?

45. Which station(s) do you listen to at home?

46. Primarily what type of programming do you listen to?

SECTION III: COMPUTER OWNERSHIP/ACCESS FROM HOME

- 47. Do you have a computer at home? ___ More than one _____
- 48. What type(s) of computers do you have? Mac PC WK Other _____
- 49. Which other peripherals do you have at home?
Printer(s), modem(s), fax, scanner..?
- 50. Cellular phone in car?
- 51. Do you have a PC at work?
- 52. Do you have a Workstation at work?

VISUAL AID: COMPUTER SKILLS

- 53. How would you describe your computer skills?
Keyboarding, hooking up home system, loading software, hook up
peripherals, use a modem
Poor-- Fair-- Good-- Very good-- Excellent

SECTION IV: CITYNET & E-MAIL USE

- 54. How did you hear about Citynet?
- 55. What prompted your Citynet subscription?
- 56. Number of hours allotted daily:
- 57. When do you log on?
- 58. Who else logs on in household?
- 59. Today is _____ in the last 7 days how many hours have you logged on?
Is this a weekly average or more/less than usual?
- 60. Other online service s subscriptions:
- 61. How many hours on e-mail at work in last 7 days?
- 62. How many hours a week on computers
- 63. Number of other e-mail accounts and suppliers/vendors?

ACCESS TO CITYNET

- 64. Are you hooked up to CityNet at home?
- 65. At work?
- 66. At public kiosk location?
- 67. What made it easy?
- 68. What made it hard?
- 69. What words best describe the experience of loading the CityNet application?
Simple--Easy --Average difficulty--Hard-Very hard
- 70. How do you learn how to send email outside of City?
- 71. Which items do you use?
- 72. Who do you email to?
- 73. Do you go onto bulletin boards
- 74. Live chat line?
- 75. Access to Internet?

76. How would you rate your satisfaction levels with CityNet? Select one
Low--Low to Medium--Medium--Medium to High--High
77. Classify community type of individual user
78. How do you use CityNet for community news, information or entertainment?
79. When you use each method of communication?

Email

Telephone

Fax

Face to face

U.S. Mail

80. Is e-mail a replacement for travel from one spot to another in the city?

81. Is it a link to people?

82. Is it a link to information sources?

On-line Communications

83. Do you talk one-to-one or one to-several people online? One____ Several____

84. Have you met people online & continued conversations/email with them?

85. Have you met any of your online chat partners in person?

86. Do you drop in on chat lines..and participate?

Yes____

No____

Drop in and lurk____ Drop in and participate____

87. How do you tell someone's emotions/tone of voice online?

Goals and results of use of CityNet

88. What do you accomplish online with CityNet?

89. What can you do online with CityNet that you cannot do on other
networks/online services?

90. What can you do online with CityNet that is different in conversation that takes
place F2F?

SECTION V: CITYNET OWNERSHIP/CONTROL

91. Is CityNet profit or non profit?

92. How was it developed? Who developed it and Why?

93. How can you change or request modifications/refinements to CityNet?

94. Are your requests responded to? In what way?

95. Will you continue to subscribe to CityNet? Why or why not?

96. What improvements have users requested and received to CityNet?

97. Is there an authority or control mechanism on CityNet?

98. Is there censorship of any communication?

99. When do you use CityNet instead of other online services?

100. What is the one feature you would like added to improve service?

101. How can CityNet better publicize service?

102. How could you have been trained better to do things on Citynet?

SECTION VI: DEMOGRAPHICS

- 103. Marital status
- 104. Number of children
- 105. Ages of children
- 106. Household income
- 107. Occupation
- 108. Education
- 109. Age
- 110. Place of birth

■ ■ ■ ■ ■ ■ ■ ■

**Circle represents city of
Cupertino**

Use "X" to place
self in relation
to Cupertino

■ ■ ■ ■ ■ ■ ■ ■

Computer skills

Poor

Fair

Good

Very Good

Excellent

Technology Adoption Curve

Leader Early adopter Middle majority Late adopter

Choice of responses

Quality of K-12 education

Libraries

Citizen participation in government

Parks & Open space

Commercial/industrial growth

Affordable housing

Water & air quality

Senior services

Youth services

Community services

Other priority: _____

Appendix B

San Jose State Human Subjects Review Board Approval

June 1995

Office of the Academic Vice President • Associate Academic Vice President • Graduate Studies and Research
One Washington Square • San Jose, California 95192-0025 • 408/924-2480

TO: Janice Morgan
1911 Jonathan Ave.
San Jose, CA 95125

FROM: Serena W. Stanford *Serena W. Stanford*
AAVP, Graduate Studies & Research

DATE: July 6, 1995

The Human Subjects-Institutional Review Board has approved your request to use human subjects in the study entitled:

"Extending Community Attachment to Computer-Mediated
Communications: A Case Study of Cupertino's City Net,
Inc."

This approval is contingent upon the subjects participating in your research project being appropriately protected from risk. This includes the protection of the anonymity of the subjects' identity when they participate in your research project, and with regard to any and all data that may be collected from the subjects. The Board's approval includes continued monitoring of your research by the Board to assure that the subjects are being adequately and properly protected from such risks. If at any time a subject becomes injured or complains of injury, you must notify Serena Stanford, Ph.D., immediately. Injury includes but is not limited to bodily harm, psychological trauma and release of potentially damaging personal information.

Please also be advised that each subject needs to be fully informed and aware that their participation in your research project is voluntary, and that he or she may withdraw from the project at any time. Further, a subject's participation, refusal to participate, or withdrawal will not affect any services the subject is receiving or will receive at the institution in which the research is being conducted.

If you have any questions, please contact me at (408) 924-2480.