Visions and the Use of a Community Information and Communication Technology (ICT): Assessing the Effectiveness of the Delivery of Community Network Services

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Abstract

This study investigated the use of community information and communication technologies in light of its dual visions (i.e., serving as an affordable Internet service provider and a community building tool). Surveying the randomly selected users of a community network (n = 213), this study examined the influence of the community features on service use compared to that of Internet features. The present study found that the respondents were using the service mainly for general Internet features, such as email and web access. More than two-thirds of the respondents did not recognize community contents as available service. Community features of the service were found as significant predictors of use only among people who were aware of community contents but not among people who were not. Nonetheless, there was no difference in the amount of use between the two groups, indicating that the awareness of community contents itself did not increase use. Findings suggest that the service providers did not fully communicate the community aspect of the service with the users although the very aspect distinguishes the service from other Internet services.

Key Words : community information, communication technology,
　　　　　　 information communication technology

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I. Introduction

Innovative applications of new information and communications technology (ICTs) present new opportunities to improve our daily living environments. Community ICT or community informatics has emerged as an important area of information studies in this development. Community informatics is a practice that involves the use and adoption of new ICTs to influence the social, cultural, and economic development of community.[2] As a prototype of community informatics, electronic community networks (CN) serve the public with a vision of building a better local community through the Internet.[3] Because of this explicit focus on community, the service providers seem to assume that people use their service with an expectation of community contents. However, this assumption requires further scrutiny.

Previous literature raises a question about whether the providers vision of community building is truly shared with their users. For example, in a survey of a Canadian CN, Patrick and Whalen found that citizens used the service mainly to connect to the Internet but not necessarily to connect to their local communities.[4] In a recent study of three American CNs, Pettigrew, Durrance, and Unruh reported a mismatch between what users believed service providers would offer and what they actually used.[5] A consistent finding was reported in a study conducted to the users of 13 community networks in Korea.[6] These studies indicate that the CN services may not be used by the users as the providers intended. They further suggest a possible gap between ideal and actual use of this community informatics. That is, citizens may have been using the service just as

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2) B. Loader, Community informatics and development. In *Encyclopedia of Community,* edited by D. Levinson and K. Christensen (Newbury Park, CA: Sage, 2003), pp.275-278.

3) Michael Gurstein, Community Informatics, Community Networks and Strategies for Flexible Networking, In *Community Informatics: Shaping Computer-Mediated Social Relations,* edited by L. Keeble and B. Loader (London: Routledge, 2002), pp.263-267.

4) A. Patrick and T. Whalen, "*Network Services Research.*" <http://debra.dgbt.doc.ca/services-research/> [cited 1998.1.18].

5) K. E. Pettigrew, Joan C. Durrance, and Kenton T. Unruh, Facilitating Community Information Seeking using the Internet: Findings from Three Public Library-Community Network Systems, *Journal of the American Society for Information and Technology,* Vol. 53, No. 11 (Sep. 2002), p.898.

6) Information Culture Center of Korea, *Community Network User Survey.* Research Paper, 98-05, (Seoul : Information Culture Center of Korea, 1998), pp.101-105.

a free or affordable Internet service provider (ISP), but not much of as a service through which they obtain community information and share ideas with their neighbors. However, this speculation has not been closely investigated using a systematically selected sample through empirical research. Research on this issue is critical because we cannot expect accomplishing the vision of community building without service users awareness and the use of the community aspect of the service. Therefore, the current study investigated the influence of community aspect of the service on community network use in light of its dual visions (i.e., serving as an affordable Internet service provider and as a community building tool).

II. Literature Review

1. Development of community networking

Among many areas of CI practices, community networks (CNs) are considered to be the most prominent area that delivers information and communication services to local residents.[7] In the United States, many CNs have been established encouraged by the initiative of National Information Infrastructure. Over 250-300 CNs were operating in North America by the mid-1990s either as independent, non-profit organizations or through collaboration with local institutions. Public libraries, in particular, have been active participants in this development.[8] As many local public libraries have integrated this service into existing outreach services, the researchers in the field of library and information studies (LIS) have paid close attention to this service.[9] While various issues on community networking service have been investigated both in and out of LIS discipline, little is known about how the visions of community networking have been

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7) Michael Gurstein, *op, cit.* p.265.
8) Stephen Bajjaly, *The Community Networking Handbook* (Chicago: American Library Association, 1999), pp.12-34.
9) Joan Durrance and Karen E. Pettigrew, *Online Community Information: Creating a Nexus at Your Library* (Chicago: American Library Association, 2002), pp.43-48.

fulfilled over the past ten years.

2. Two Visions behind Community Networking

There are two explicitly stated visions in relation with community network services. First vision relates to the provision of a free, publicly accessible dial-up connection to the Internet to all local residents.[10] Rooted in this Free-Nets concept that was initiated by Tom Grundner, many CNs were established by those individuals who believed that CNs could provide access to the Internet for those who could not afford to getting on the information superhighway. This aspect of vision has attracted those who were concerned about the digital divide between the information haves and the have-nots because they believed it as an excellent solution to promote equal access to the Internet.

The other vision relates to community building. The service providers believed that CNs are excellent tools that could vitalize their community and strengthen civic democracy.[11] A CN builds a one-stop shopping place in which various local organizations provide information about their services and resources that could solve citizens everyday problems. Those services and resources include information about community events, local government, non-profit social service organizations, job opportunities, health services, public transportation, adult education classes, school lunch menus, and advice from local experts such as automobile mechanics, lawyers, librarians and policemen. By delivering these services, the providers believed that their services could enable people to feel a sense of community, to increase feelings of empowerment, and to connect for community action. Furthermore, the providers believed that their services could help the public make informed decisions for their communities and thus eventually make their communities a better place to live. While the first vision can be accomplished by establishing the information infrastructure in a local community, the second vision can be accomplished by compiling and delivering useful community

10) H. Kubicek and R. N. Wagner, Community Networks in a Generational Perspective: The Change of an Electronic Medium within Three Decades, *Information, Communication & Society, Vol.* 5, No. 3 (2002), pp.293

11) Doug Schuler, *New Community Networks: Wired for Change* (Reading, MA: Addison-Wesley, 1996), pp.111-143.

contents.

3. Questions in the vision of community building

Looking into the diffusion of community networks across many communities in North America, CNs are widely recognized along with their great vision of community building and this vision is articulated in most CN initiatives. However, this vision seems to have been neglected largely in its development because of a greater emphasis on the first vision, equal access for every citizen. Therefore, it is questionable whether the vision of community building is truly shared with the users and whether people use the service with an anticipation of community contents.

Previous studies suggest that the providers vision of community building has not been communicated well to its users possibly because such vision was not necessarily the users motive to use the service. One such example is a user survey of National Capital Freenet (NCF), a CN in Ottawa, Canada. According to the survey results, the use of local information was low and the service did not increase citizens community involvement. Reporting on the underutilization of community contents, Patrick and Whalen noted, the focus of the NCF is local services for the community, and yet the most frequent commands are accessing external services and world wide community, there may be some conflict in [providers'] goals and [users'] expectations. [12] Although the study did not further examine the cause of the conflict, the findings suggest a possible gap between the ideal of community building and the reality of service use (that is, merely a low- cost Internet service provider). Similar findings were reported from the studies conducted to Korean CNs.[13]

Having these reports, one might ask how the service is perceived by its users. As anticipated, some people would use the service because of their anticipation of using community contents. However, many others seem to use the service because they regard the service as a free or an affordable ISP, without knowing much of its community contents. People who are not aware of community contents would have different

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12) Patrick and Whalen, *op, cit.* p.1
13) Information Culture Center of Korea, *op, cit.* p.102.

perceptions of the service from people who are. These different perceptions, in turn, would result in different usages. Therefore, the current study attempted to investigate the above speculations by answering the following two research questions:

Research question 1: Is there any difference in the use of a CN between people who are aware of the services community contents and people who are not.

Research question 2: When compared with the Internet aspect of the service, does the community aspect of the service stimulate people to use a CN?

Each of the two research questions were answered by testing two hypotheses, respectively:

Hypothesis 1: There is a difference in CN use between people who are aware of the services community contents and people who are not.

Hypothesis 2: The community aspect of the service further explains CN use after controlling for the Internet aspect of the service.

Hypothesis 2 was examined further by dividing the users into two groups split by their awareness of community contents (yes/no). It is expected that the community aspect of the service predicts CN use only among people who are aware of the services community contents but not among people who are not. A conceptual framework of the current research was developed for the purpose of this study<Fig. 1>.
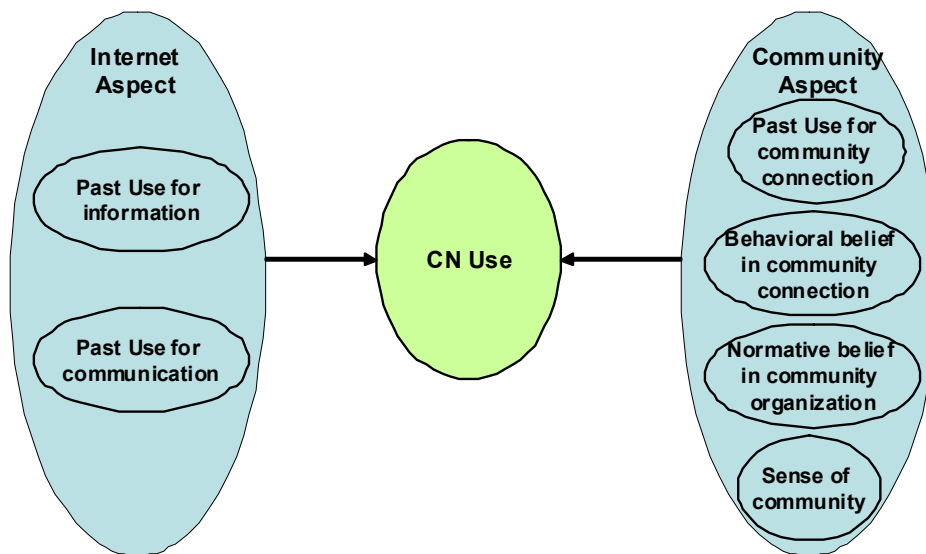
<Fig. 1> The Conceptual Model of Community ICT Use

As Figure 1 shows, the conceptual framework consists of two aspects of the service, Internet aspects and community aspects, representing the two visions of community networks. If the community aspect is an important stimulus that motivates people to use the service, it should be able to explain use significantly over and above the general Internet aspect. The next section describes the selected variables that represent each of the two aspects.

4. Conceptualizations of major research variables

(1) Internet Aspect. The following two variables were selected to represent the Internet aspect of the CN:

Past use for information and *Past use for communication*. Past behavior has been studied as an important predictor of a persons future behavior. The underlying

assumption is that experience from past behavior forms particular beliefs and perceptions about the behavior, which affects future behavior. Accordingly, past use has been one of the most frequently examined variables that predict the use of information technology (IT).[14][15] Two major uses of the Internet are information gathering on the Web and communications via email. Since CNs were first introduced to citizens as a free or affordable local ISP, past use of these two Internet features would predict CN use. In this study, *past use for information* refers to past use of the service for Web features that gratify the needs for information and learning. *Past use for communication* refers to past use of email features that gratifies the needs for social interactions.

(2) Community Aspect. The following four variables were selected to represent the community aspect of the CN:

Past use for community connection. Probably, what distinguishes a CN most from other similar services is its explicit emphasis on access to local resources and people. *Past use for community connection* was, thus, selected as the first variable that represents the community aspect of the service. *Past use for community connection* in the current study refers to past use of a CN that helps people connect to their community through its local contents, by exchanging ideas on local issues, or by creating a sense of belonging or a sense of supporting the community.

Behavioral belief in community connection. Behavioral belief relates to expectations that performing a certain behavior would bring certain consequences. Behavioral belief has been known to be an important motivational force of behavior.[16] As a psychological concept, beliefs are often defined as a composite construct in the form of an expectancy-value.[17] In the context of CN use, if a person *expects* that her/his use of a CN will bring a certain outcome and if the person *values* the outcome positively, the

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14) Thomas Hill, Nancy D. Smith, and Millard F. Mann, Role of Efficacy Expectations in Predicting the Decision to Use Advanced Technologies: The Case of Computers, *Journal of Applied Psychology*, Vol. 72, No. 2 (May 1987), pp.307-313.
15) Shirley Taylor and Paul A. Todd, Assessing IT Usage: The Role of Prior Experience, *MIS Quarterly*, Vol.19, No.4 (Dec. 1995), pp.561-562.
16) Philip Palmgreen, Lawrence A. Wenner, and Karl E. Rosengren, Uses and Gratifications Research: The Past Ten Years. In K.E. Rosengren, L.A.Wenner, and P. Palmgreen (Eds.), *Media Gratifications Research* (Beverly Hills, CA: Sage, 1985), pp.11-37.
17) Icek Ajzen and Martin Fishbein, *Understanding Attitudes and Predicting Social Behavior* (Englewood Cliffs, N.J.: Prentice-Hall, 1980), pp.28-39.

person is more likely to use the CN. In this study, *expectation of community connection* is conceptualized as the perceived probability that use will provide the gratifications of connecting to the community. *Value of community connection* refers to an individuals assessment of the desirability of community connection from using the service. It is conjectured that a users expectation and value of community connection would make the person use the service.

Normative belief in community organizations. *Normative belief in community organizations* relates to the influence of community organizations on use. Again, in the form of the expectancy-value construct, *expectation of community organizations* is defined in this study as the likelihood that referent local organizations either approve of or disapprove of a persons CN use. *Motivation to comply with community organizations* refers to the persons willingness to comply with the referents. Unlike other cyberspaces, a CN is a public sphere where local organizations actively participate and create an atmosphere of a real physical community.[18] Local organizations and a CN collaborate reciprocally in this process. For example, the local organizations receive free-web space and technical supports from the CN in order to promote their services to local residents. By organizing the information from and about local organizations, the CN can build a rich community information database. Because of this active partnership, the participating local organizations are likely to encourage citizens to use the CN. Therefore, citizens use of the CN is likely to be influenced by their expectation of and willingness to comply with local organizations encouragement of using the service.

Sense of community. A sense of community was selected as the fourth variable that represents the community aspect of the service. *Sense of community* is defined in this study as belonging to the neighborhoods and shared emotional connection. It is speculated that people with a greater sense of community would be more interested in obtaining their community information and in making more contacts with local people and organizations. If the CN is perceived to satisfy such needs, people would be more likely to use the CN.

(3) Community contents awareness. This variable was used to divide users into those

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18) Philip A. Thompsen, Toward a Public Lane on the Information Superhighway: A Media Performance Analysis of the Community-Wide Education and Information Service Initiative. (Ph.D. Dissertation, University of Utah, 1997), p.5.

who are aware of community contents and those who are not (*Note*: Hereafter these two groups are called as awareness group and unawareness group, respectively). In the present study, community contents awareness refers to ones expressed knowledge of community-related contents in the CN.

III. Method

1. Population and Sample

The population of the study represented current and former users of a community network, who were 18 years old or over. The CN selected for the present investigation was one of the most successfully operated community networks in North America. It was a recipient of many grants from local and federal agencies. At the time of the study, the network was serving more than 5,000 citizens and 500 organizational members at a Mid-western community. The members could access a full range of Internet services (i.e., e-mail, newsgroups, WWW, FTP, telnet) as well as community information resources.

2. Instrument

A self-administered questionnaire was used for the current study. Existing scales were adopted or modified if they were available and previously yielded reliable scores. The content-related validity of this questionnaire was enhanced by administering it to a total of 50 current and former users of the community network during January-March 2001 (i.e., pilot phase). The survey instrument was then finalized after incorporating suggestions made by the pilot group, as well as from experts in survey design and community network services. Late March, the questionnaire was mailed to 1,000 people who were randomly selected from a membership database that listed all current and

former members of the service. Three weeks later, a brief follow-up questionnaire was mailed to measure the dependent variable, use.

A total of 422 responded to the first survey. Among those respondents, 218 answered the second survey. This comprised 56.5% of the first survey responses. Only those who answered to both surveys were included in the data analysis. Due to this attrition of the respondents, a series of independent t-tests was conducted in order to identify differences in demographic characteristics between the respondents who answered the first survey only (n = 422) and those who answered both surveys (n = 218) (a < .05). Two samples were not statistically significantly different in terms of their demographic characteristics (i.e. gender, age, education, and income).

3. Measurement Operationalizations

3.1 Dependent variable

Community network use (*Use*) was the ultimate dependent variable of the current study. It was measured using two self-reported items: frequency of use measured on a 7-point frequency scale and the total amount of weekly use hours. The responses from each item were first standardized and then both items were averaged to compute a standardized score of use.

3.2 Independent variables

Internet aspect. The two variables representing the Internet aspects of service were *the frequency of past use for information* and *the frequency of past use for communication.* Each was measured on the same 7-point frequency scale used for CN use

Community aspect. The following four predictors represent the community aspects of the service. First, *the frequency of past use for community connection* was measured using the same 7-point frequency scale used for CN use. The remaining three predictors are psychometric variables that are not directly observable. They were measured by

multiple items on a 7-point Likert-type scale to enhance item variability and reliability.[19]
Behavioral belief in community connection was measured by seven items and *normative belief in community organizations* was measured by four items. Both beliefs were measured by adopting Ajzen and Fishbeins 1980 scale. The specific referents used for these two beliefs were elicited from pilot tests and previous research. Finally, *sense of community* was measured with four items selected from Davidson and Cotter. The reliability scores of the three psychometric variables obtained from this study were .8889, .7540, and .9292 in the order of presentation, indicating all three achieved an acceptable level of reliability score.

Community content awareness. Community contents awareness was measured by a dichotomous variable, yes or no. The respondents were asked to check (X) on yes if the following statement applies to them: *To me, using the community network means using local community information resources hosted or compiled by [name of the CN] (for example, community directory, Whos Who Online)*

The operational definition of each research variable is summarized in Appendix.

IV. Results

1. Demographic Descriptions of Participants

The general demographic characteristics of the survey participants were as follows: Fifty-four percent of the respondents were female, showing a fairly even gender distribution. Age was distributed from 18 to 83 years old with an average age of 50 years old. The median educational attainment was Graduated 4-year college on a 7-point educational attainment scale. The median household income fell into the range between $30,000 and $49,999 on a 7-point income scale. The average years of experience using the service was approximately 4 years (i.e., 47 months). In relation with user awareness

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19) Robert F. DeVellis, *Scale Development: Theory and Applications* (Newbury Park, Calif.: Sage Publications, 1991), pp.12-50.

of community contents, the respondents were asked whether they considered local community information resources as part of their use. Among the 213 respondents who answered the question, 68 respondents (31.9%) reported yes and 145 respondents (69.1%) reported no.

2. Community network use (Use)

Community network use *(Use)* was measured with two survey questions: the frequency of use and the amount of weekly use. Approximately half (49.1%) of the respondents answered they used the service at least once a day in a normal week, 17.5% answered 4-6 times a week, 15.8% answered 1-3 times a week, 4.5% answered a few times a month, and 7.2% answered less than once a month. People who did not use the service at all in the past 30 days comprised 5.9% of the respondents.

The average amount of weekly use was reported as 4.2 hours. The respondents who were aware of community contents used the service 3.95 hours per week;

whereas, the respondents who were not aware of the community contents used the service spent 4.25 hours. Hypothesis 1 tested the statistical significance of this difference using t-test. The test result shows no statistically significant difference in Use between the two groups (t = 1.43). Thus, Hypothesis 1 was not supported (a < .05).

3. The Influence of Community Aspect on Use: Overall Group Analysis

Hypothesis 2 tested whether community aspect of the service explains Use significantly over and above the Internet aspect. A hierarchical multiple regression model was constructed for this test. As a technique testing a theoretical causal model, a hierarchical multiple regression assesses the unique contribution of the predictors of interest in explaining the dependent variable, while controlling for the influence of all other variables in the model. In the regression model, three control variables (i.e., *use training experience, primary interface mode (either graphical or text)*, and *the number of years using the service)* were entered into the model first in order to control their

unwanted influence on Use. Then, the two variables representing the Internet aspects were entered into the model at Step 2, followed by the four variables that represent community aspects. The test statistic *R2 change* at each step indicates the unique contribution of the newly entered variables in explaining Use over and above all the variables previously entered. The tested model is presented in the regression equation below. Table 1 presents the test results.

Use = α+ ß1Xtraining + ß2Xinterface + ß3Xexp_yrs + ß4Xpu_info + ß5Xpu_communication+ ß6 Xpu_community + ß7Xbb_community + ß8Xnb_community + ß9XSOC

<Tab. 1> Hierarchical Multiple Regression of Community Network Use: Overall Group

	Cumulative Explained Variance (R2)	R2 change	Sig. of R2 change (*p*)
Step 1a: Control variables	.016	.016	.379
Step 2b: Internet aspect	.277	.261***	.000***
Step 3c: Community aspect	.300	.023	.207

*** *p* <.001

a Variables entered in Step 1: Control Variables (Training; Primary interface mode; Years of experience)

b Variables added in Step 2: Internet Aspect (Past use_information; Past use_communication)

c Variables added in Step 3: Community Aspect (Past use_community; Behavioral Belief-Community connection; Normative belief-Community organization; Sense of community)

As indicated in Table 1, the research model explained a total of 30% of variance in Use when all variables were entered into the model (*R 2*= .300 at Step 3). Use was predominantly explained by the two Internet aspect variables entered at Step 2. These two variables increased 26.1% of variance in use (*R2 change* = .261). In contrast, the four community aspect variables entered at Step 3 added only 2.3% of variance to the total variance (*R2 change* = .023). Since this addition was not statistically significant,

Hypothesis 2 was not supported (a < .05). Therefore, it was concluded that the community aspect did not explain Use significantly over and above the Internet aspect. Use was mostly determined by the Internet feature.

4. The Influence of Community Aspect on Use: Two-Group Comparison

The influence of community features on use was further examined by comparing the two groups split by their awareness of community contents. The same regression model tested for the overall group was used for the separate group test. Table 2 presents the test results.

<Tab. 2> Hierarchical Multiple Regression of Community Network Use by Community Contents Awareness: Two-Group Comparison

	Unaware of community contents(n=145)			Aware of community contents (n=68)		
	Cumulative Explained Variance (R2	R2 change	Sig. of R2 change (p)	Cumulative Explained Variance (R2)	R2 change	Sig. of R2 change (?)
Step 1a	.027	.027	.341	.019	.019	.779
Step 2b	.219	.192	.000***	.434	.415	.000***
Step 3c	.243	.024	.448	.535	.100	.038

*** p <.001; * p < .05
a Variables entered in Step 1: Control Variables (Training; Primary interface mode; Years of experience)
b Variables added in Step 2: Internet Aspect (Past use_information; Past use_communication)
c Variables added in Step 3: Community Aspect (Past use_community; Behavioral Belief-Community connection; Normative belief-Community organization; Sense of community)

As presented in Table 2, a series of analyses showed predominant influences of the

Internet feature on Use. Commonly in both groups, the two Internet aspect variables explained a statistically significantly more variance in use as they were entered into the model at Step 2. R2 changes were .192 (p < .001) and .415 (p < .001), respectively. When the four community aspect variables were entered into the model at Step 3, however, their influences were different across the two groups. First, community aspect variables increased only 2.4% among the people were not aware of community contents. This change was not statistically significant (p < .05). Consistent with the findings from the earlier overall group analysis, Use was mostly determined by the Internet feature in this group. In contrast, in the group who were aware of the community content, the variable representing the community aspect explained an additional 10.0% of variance in use over and above the Internet aspect. This increase was statistically significant (p < .05). Due to this contribution, the research model explained a total of 53.5% of variance in use in this group. This is far greater than the total variances explained in the former group (24.3%) as well as in the overall group (30.0%).

Ⅴ. Discussion

This study was initiated because there was a perceived gap between the ideal and the reality of a community informatics practice. There has been a concern that citizens may use the service just to access the Internet, although the providers also believe it to be an effective tool for community building. This concern was confirmed in the current study. Nearly 70% of the survey respondents failed to recognize local contents as part of the service. This finding may indicate a significant knowledge gap in the users understanding of the service.

To the majority of the respondents, the community aspect was not a major reason to use the service. Instead, the Internet aspect was found to be the major reason. This finding is consistent with the study that reported low level of service use as compared to the strong network infrastructure in the development of Korean community network s.[20] More importantly, there was a difference in the predictors of Use between those

who were aware of community contents and those who were not. First, to the unawareness group, email was their primary reason for using the service. In this group, peoples primary perceptions of the CN seemed to be just an affordable local Internet access service. Approximately two-thirds of the respondents fell into this category. This finding could be explained by the fact that the CN has not fully developed its community aspect of the service. The CN has placed a greater emphasis on its ISP function compared to the community information service function from its inception. Many local citizens were introduced to the Internet through the CN because the CN has endeavored to reach out to the people who might not be able to getting on the information superhighway otherwise. These people seem to have been using the service mostly as an ISP but not much for the other function. Furthermore, they seemed not having much chance to get exposed to community contents due to insufficient or ineffective contents. As a consequence, these users have not been able to develop their expectations of community aspect of the service.

The findings from the awareness group (i.e., the people who were aware of community contents) are sharply distinguished from the former group. In this group, community aspect variables were found as significant predictors of Use. Nonetheless, the fact that less than one third of respondents fell into this category indicates a considerable problem in users understanding of the service. More importantly, the comparison of the two groups showed that CN users were divided by their perceptions and use patterns, and the division is deeply associated with their understanding of the community aspect of the service.

VI. Summary and Implications

Discussing the changes and adaptability of community networks over the last three decades, Kubicek and Wagner contended that CNs are now in the midst of transitioning to

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20) K. Shin and D. Choi, urrent Trends and Future Development of Community Networks, *Information and Communication*, Vol. 16, No. 7 (1999), p.798.

the next generation because of their inadequate positioning in the current ICT market.[21] In fact, the lack of understanding of the user might be a culprit of such ineffective, dwindling services in the past few years. With an intention to provide a better understanding on the use of community-based ICT, the current study investigated user perceptions and use of a CN. Specifically, this study examined the use of a CN in light of the visions embedded in the service. The visions are reflected in their dual goals pursued by the service: to provide an affordable Internet access and to serve as community building tool.

The findings of this study offer implications for the current service providers and future research. First, the finding that over two-thirds of the users failed to recognize the community contents suggests that the CN providers have been effective only in promoting the first goal while largely have failed in meeting the community building goal. It suggests a definite gap between the expressed goal and actual pursuit of the goal from the providers side. This finding further confirmed the alleged discrepancy between providers' goals of community building and users' expectations reported. An implication from this finding is that the providers should communicate their community building vision with their users by making community contents more visible and useful to its users.

Another finding suggests that the awareness alone does not increase actual use unless the contents are usable and useful. The present study found little difference in the amounts of service use between those who were aware of community contents and those who were not. This finding supports Pettigrew et al.s recent efforts to identify ten barriers to community information systems.[22] The barriers include poor interface design, poor organization, missing information and dead links, unidentified authority, and non-anticipatory systems. Findings from both Pettigrew et al.s and the present study consistently address the need to improve the helpfulness and usability of the contents of digital community information systems. In order to provide a more complete understanding of user perceptions, use, and problems in delivering the service, future studies should analyze the quality of actual community contents and test the usability of the system.

Finally, the study finding offers another implication for the current community networking efforts in Korea. Observing the earlier development of community networking

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21) H. Kubicek and R. N. Wagner, *op, cit.* pp.304-305.
22) Karen E. Pettigrew, Joan C. Durrance, and Kenton T. Unruh, *op, cit.* pp.898-901.

in Korea, the possible role of local public libraries has been surprisingly unrecognized by its developers. While the developers have pointed out both post offices and newly established local information centers as viable windows of the community networking, they have neglected public libraries, the established local information center. However, the contribution of public libraries could be far greater. Recognizing community networks close ties with their missions of informing and empowering local citizens, many American public libraries have integrated community networking into their existing outreach servicesinformation and referral services (I&Rs) for local residents.[23]This integration enabled the public libraries to deliver their community information more effectively via networked technology. Community networking is not just wiring the community with the network technology but also constructing useful community information system. Considering the fact that the dwindling community networking is due to the lack of use, the providers should pay closer attention to developing quality community contents. This role can be most effectively done by professional public librarians through their active participation in community networking.

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23) Joan C. Durrance and Karen E. Pettigrew, *op, cit.* pp. 16-18.

Appendix: Summary of Measures of Research Variables

Variables	Questionnaire items
Dependent Variable	
Community network use	How many hours in total did you use [*name of CN*] in the past week?
	How often did you use [*name of CN*] during the past 30 days? (Answer on a 7-point frequency scale: Not at all /Less than once a month / A few times a month / 1 - 3 times a week / 4 - 6 times a week /About once a day /More than once a day)
Internet Aspect Variables	
Frequency of past use for information	In general, how often do you use the service for www access? *(Measured on a 7-point frequency scale)*
Frequency of past use for communication	In general, how often do you use the service to use the email? *(Measured on a 7-point frequency scale)*
Community Aspect Variables	
Frequency of past use for community connection	In general, how often do you use the service for searching local Information or communicating with local people? *(Measured on a 7-point frequency scale)*
Behavioral belief in community connection	Value: How important is each of the following needs to you as it relates to your Internet use in general? (Not at all important·Extremely important) Expectancy: How likely is it that each of the following needs would be satisfied by your using the service? (Extremely Unlikely·Extremely Likely) (Measured on 7-point Likert-type psychometric scales)
	Getting information from local government, social service agencies or other local nonprofit organizations
	Getting information about local businesses
	Getting information about local events or activities
	Exchanging ideas or sharing information with people in my local area
	Feeling a sense of community
	Supporting a local nonprofit organization
	Helping to strengthen my community

Normative belief in community organizations	Value: Among the social groups you interact with, some might influence you more than others. As they relate to your Internet use in general, how influential is each of the following groups to you? (Not at all influential · Extremely influential) Expectancy: Now, what would each of those social groups think about your actual (or potential) use of [name of CN]? Please answer on a 7-point scale, where 1 means They would think I shouldnt use the community network and 7 means They would think I should use the service. (Measured on 7-point Likert-type psychometric scale)
	Local social service agencies /advocacy groups
	Local educational institutions
	Local public libraries
	Social clubs I am affiliated with
Sense of community	Do you like the city/town you live in? (Definitely No·Definitely Yes)
	Do you like the people in your city/town?
	Do you feel like you belong to your city/town?
	In general, do you feel a sense of community with others in your city or town?
Community contents awareness	What does Using [*name of the CN*] mean to you? Please check (X) in the blank if it applies to you. (Considered to have definition if marked on the following choice.) ____Using local commnity information resources hosted or compiled by the community network (for example, community directory, Whos Who Online)
Control Variables	
Primary interface mode	Which interface do you use most often in using the community network? [Choose either text-based Interface or the Web-based graphical Interface]
Training experience	Have you received any type of training from the service? [Yes/No]
Number of years using the service	How long have you been using (or did you use) the service? About _____ years in total OR About _____ months in total