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Examining Information Sharing and Relationship Building in Online Social Networks: An Emergent Analytic Framework

Abstract:
Studies of collaborative information use in electronic environments suggest that virtual communities share characteristics with face-to-face communities. The authors expand on an existing model to present an analytic framework for examining online social networks. The framework emphasizes the information sharing behaviors that are critical in building critical relationships in these online communities.

Résumé : Les études sur l'utilisation collaborative de l'information dans les environnements électroniques suggèrent que les communautés virtuelles partagent des caractéristiques communes avec les communautés réelles. Les auteurs développent un modèle existant afin de présenter un cadre analytique pour l'exploration des réseaux sociaux en ligne. Le cadre souligne l'importance des comportements de partage de l'information qui sont essentiels pour la construction de relations indispensables dans ces communautés virtuelles.

1. Introduction

Studies of collaborative information use in electronic environments suggest that online communities have many characteristics in common with face-to-face communities. In this paper, the authors acknowledge the usefulness of MacMillan & Chavis' (1986) model of community, and expand on this model to present an analytic framework for examining online social networks. The product of an ongoing study of online university courses, this framework places particular emphasis on the information sharing behaviors that are critical in building the relationships upon which these online communities are based.

The framework is conceptualized as a four-tier pyramid. The foundational first tier is composed of the basic building blocks of community included in MacMillan & Chavis' (1986) model of community. These include 1) membership, 2) influence, 3) integration and fulfillment of needs and 4) shared emotional connection. This primary tier of the framework also addresses ways in which these four basic underpinnings, initially used to describe to face-to-face communities, also apply to online communities.

The second tier expands on these basic underpinnings, bringing in the concepts of social network analysis and social capital. In discussing this tier, the authors assert that online communities are primarily built and buttressed through formal and informal communication and information sharing. This is in contrast to traditional, geographically static, interest based communities, where the "coin of the realm" for relationship building

often includes the ritual sharing or exchange of "things" such as baby gifts, birthday cards, and meals (Gusfield 1975).

The third tier of the analytic framework addresses how current theories and models of information needs, information seeking, and particularly the act of information exchange can be used to help explain ways in which online relationships are developed and evolve.

The fourth and final tier of the pyramid framework specifically examines information sharing behaviors. At this stage in its development, this tier is primarily based on Rioux's *information acquiring-and-sharing* concept (Rioux, in press). Information acquiring-and-sharing (IA&S) refers to a set of combined behaviors and processes in which an individual:

- Cognitively stores representations of other people's information needs,
- recalls those needs when acquiring (in various contexts) information of a particular type or quality,
- makes associations between the information that s/he has acquired and someone s/he knows who s/he perceives to need or want this information,
- and then shares this information in some way.

As this holistic, four-tier analytical framework for examining information sharing and relationship building in online social networks is developed it will inform the practice of librarians and other information professionals tasked with creating, maintaining and improving corporate, distance learning, research, and other information systems. Future expansion or application of this framework may also focus on how information sharing behaviors influence the development characteristics of specific online communities such as teachers, expectant mothers, immigrants, hobbyists, scientists, etc.

2. Conceptual Framework

Many scholars have proposed various approaches for analyzing different components, behaviors, attributes, etc. In this paper, the authors are presenting a more holistic design for studying virtual communities. Figure 1 graphically presents the general components of the conceptual framework and represents their relationships to each other.

The foundations of community do not vary from face-to-face to virtual versions. Gusfield (1975) identified two major distinction of the term "community. The first is the traditional version of the geographical or territorial perception of a community- i.e. an actual place with defined boundaries such as a town, city, neighborhood, etc. The second version carries more of a relational distinction. These are communities that form based on the building of human relationships. Such communities are mainly formed around a common purpose, a common goal or some other cohesive bonding effort.

Common interests lead to relationship building in both face-to-face and virtual communities. As in territorial communities, these relationships are dynamic and ever changing. Certain community members will develop stronger ties to certain members than to others.

Relationships are developed through social interactions. Such interactions include some form of exchange whether this takes the form of time spent together, exchanging actual goods (such as the proverbial cup of sugar borrowed), exchanging information, etc.

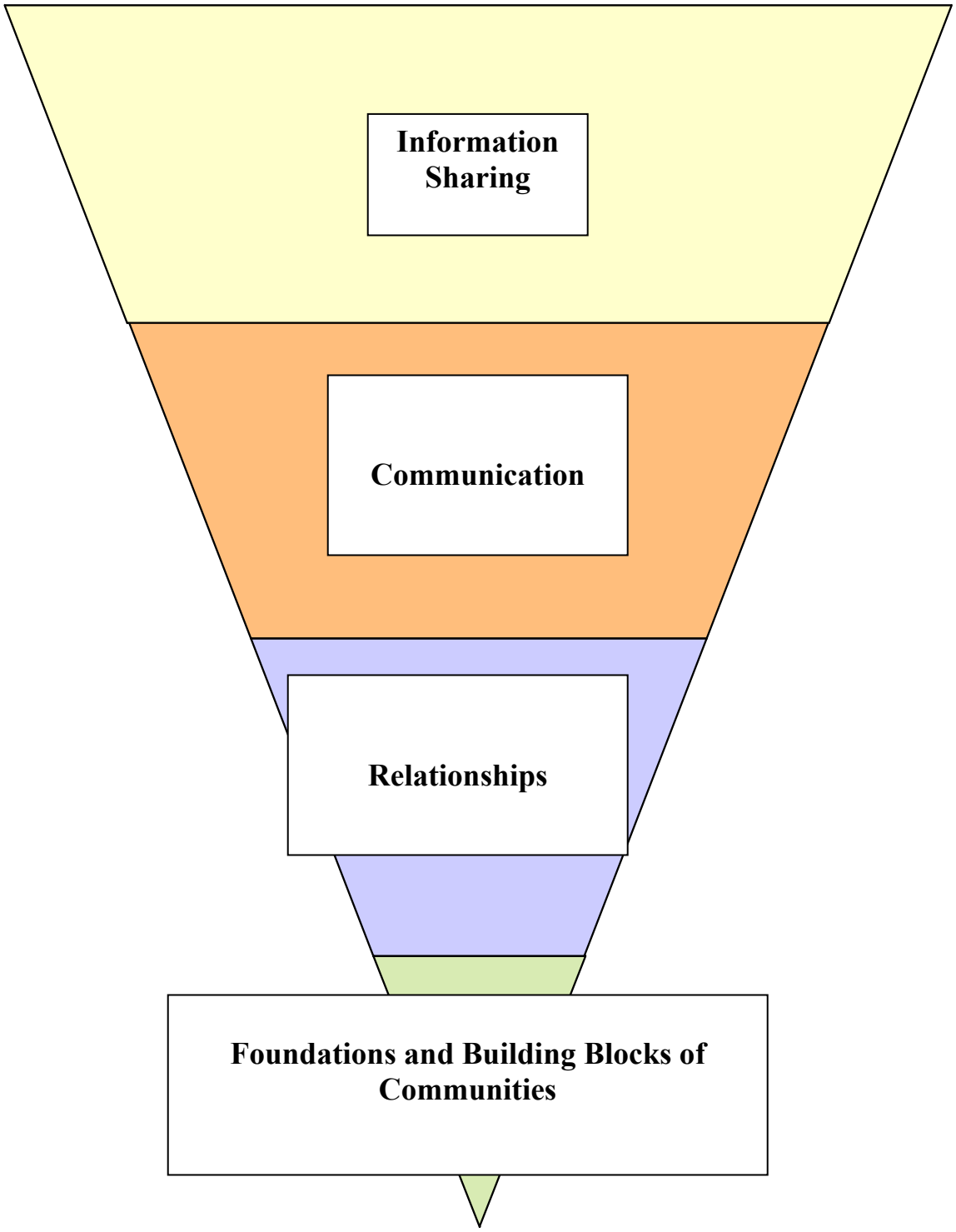

Figure 1. Conceptual framework for analyzing virtual communities.

Communication is a critical component in developing relationships within both face-to-face and virtual communities. One difference between face-to-face and virtual

communities is that in person, one might be able to "read" body language and other visual, environmental cues that might be absent in the virtual environment.

The top tier of both the conceptual framework and the analytic framework is designated as the domain where information sharing and exchange is most critically analyzed. At this level, the motivations and catalysts that prompt information sharing and exchange are examined.

3. Analytic Framework

Based on the previously delineated concepts, the authors have developed a more specific analytic framework with more specific components. Figure 2 represents, from the most general to the most specific, the elements that compose both face-to-face and virtual communities.

Foundational Building Blocks

McMillan and Chavis (1986, 9-14) identified four different elements for their theory of a sense of community. These four elements are what we are proposing that form the basic building blocks of all communities.

Membership connotes the investment that an individual devotes to a particular community. Membership also connotes a "right" of belonging. Boundaries are a natural artifact of communities; some people belong, others do not. In addition to the "belonging" factor, membership in communities can be conceptualized as a continuum of privileged insider to privileged outsider, meaning, that all might be considered members but there is a range of participation and other attributes that will

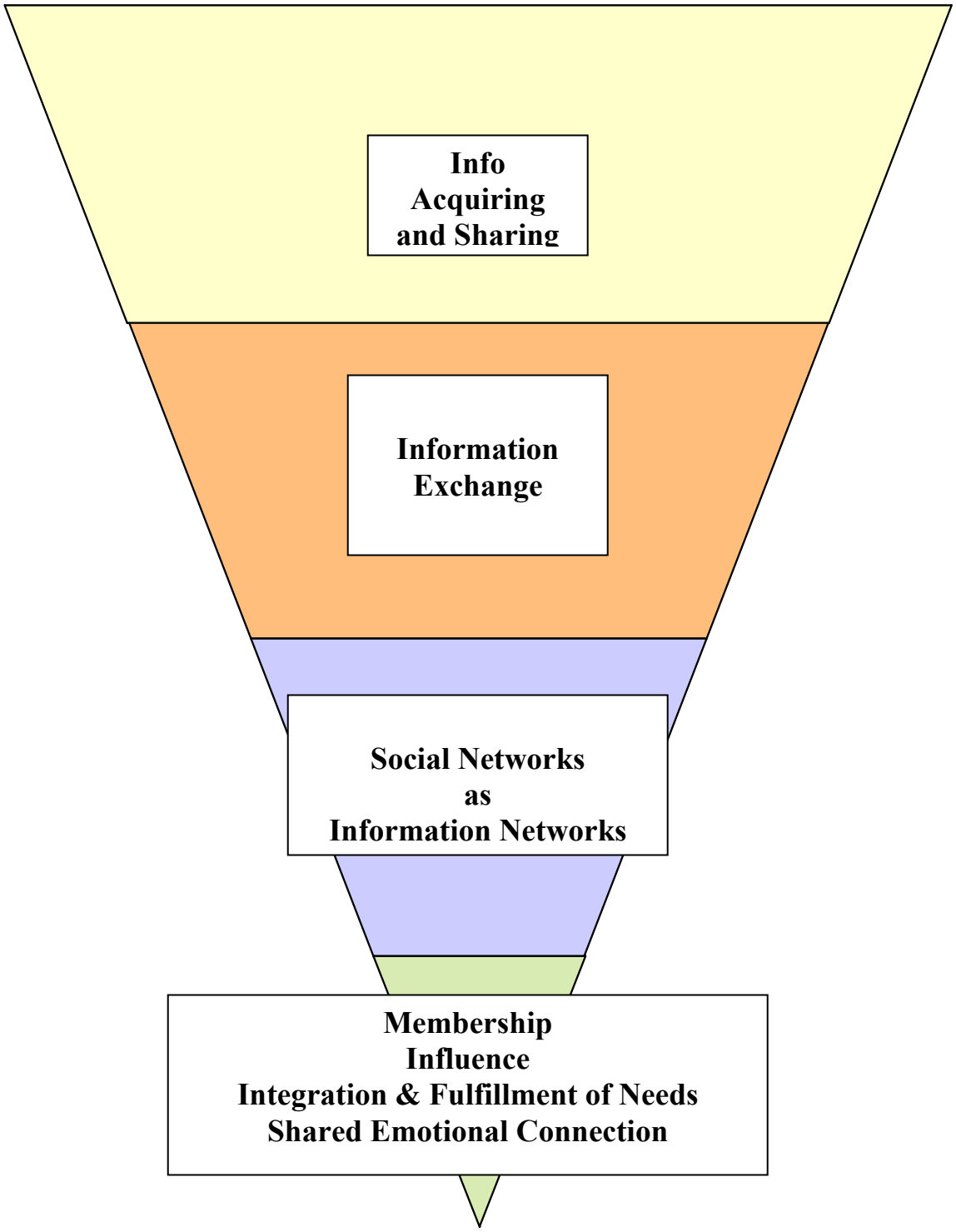

Figure 2. Analytic framework for studying virtual communities.

determine member satisfaction as a participant in a particular community. Isolation and rejection can be the negative outcome of boundary setting. Other attributes of

membership are determined by the level of:

- Safety- includes a sense of both emotional and physical security.
- Sense of belonging and identification- related to acceptance and the degree to which one identifies with a group.
- Personal investment- can denote the sense of "earning one's place" in a community. Operationalized as the level of participation one exerts.
- Common symbol system- includes community myths, symbols, rituals, rites and ceremonies.

The four above mentioned attributes, along with that of boundaries all contribute to a sense of who is considered a member of a community and to what extent one participates. In virtual communities, there is some form of "joining" action which allows one to become part of that community based on boundaries established when that community is formed. Safety might take the form of the establishment of rules against flaming, securing personal information, etc. A sense of belonging and identification might be analyzed by the amount of personal investment one chooses to input. Common symbols systems in virtual communities evolve as that community develops. Membership is a critical component of virtual communities and the level that one perceives oneself as a fully formed member often contributes to the success or failure of such communities.

Influence is the second building block of communities. Influence in communities takes a bidirectional path. Individuals influence the community and concomitantly the community as a whole influences its individuals. Members feel more satisfied in a community in which they hold some level of influence. Influence can lead to a level of cohesiveness that can indicate the strength of bonds. There can be pressure towards conformity and uniformity from members but conformity can also be a measure for closeness and cohesion. In tightly knit, cohesive communities, the bidirectional influence of members and individuals is a positive rather than a negative element. In virtual communities, influence may take the form of being an opinion leader, frequent contributor, or some other form of power with the potential to influence others in the group.

Integration and fulfillment of needs translates, according to McMillan and Chavis (1986, 12) as reinforcement. Status of members is one outcome of integrating one's needs with those of others in the community. Shared values are directing concepts when analyzing the motivation of individuals in groups. The desire to fulfill some perceived need or needs is the primary catalyst not only for the decision one makes to actually join a community but is also a strong factor in determining the degree to which one invests and participates in a community or in the decision to forfeit membership in a community. Virtual communities, like some face-to-face communities, may be more dynamic and organic than geographically based communities. People move between different virtual groups and enter and exit communities in a more transient manner than they might "real" groups.

Shared emotional connections are base on the perception of a common purpose or goals and possibly based on shared histories. Seven features (McMillan and Chavis 1986,

13-14) are important facets of such shared connections:

- Contact hypothesis- the more members interact the more likely they are to become close.
- Quality of interactions- the more positive the experiences, the greater the bond. Success facilitates cohesion.
- Closure to events- group cohesion is inhibited by ambiguity and unresolved tasks.
- Shared valent event hypothesis- the more the importance perceived of a shared event, the greater the community bond.
- Investment- investment determines the importance to which a member perceives individual status and the community's history.
- Effect of honor and humiliation on community members- the degree to which one perceives personal honor or humiliation from other community members determines the degree of attractiveness of the community.
- Spiritual bond- termed also as "community of spirit", all communities share some sense of a spiritual bond.

Analyzing what is the causal factor leading to this sense of connection is critical to developing and maintaining strong communities. Virtual communities that are established based on a perceived strong common purpose will likely exhibit a stronger identification with shared values. For example, an online community of breast cancer survivors may have a shared common experience that could manifest itself in a stronger share emotional connection. Other online groups might still share some degree of emotional connection that could evolve over time. And still others might never achieve a high degree of shared emotional connection but still function fairly well.

The four elements that form the basic building blocks of community, membership, influence, integration and fulfillment of needs, and shared emotional connection are all dynamically connected. A strong community is built on each of these elements and the better these fit together and the strength with which they are self-reinforced will determine the strength of both face-to-face and virtual communities.

Social Networks as Information Networks

Relationships between community members can be well analyzed using social network analysis methods. Social network analysis (SNA) methods enable researchers to understand relational date (Scott 2000, 3-4) such as contacts, ties, connections and group attachments. Network analysis examines the linkages between community members. Ideational data examines the meanings and motives of actions among group members. Social network analysis focuses on the social structure of groups. Cliques, density, and centrality are some of the measure that SNA can identify and describe various community attributes. For an excellent paper on "Studying Online Social Networks" see the article by Garton, Haythornthwaite and Wellman (1997) which provides an overview of social network concepts, data collection and data analysis applied to online groups

Social capital is also another social theory which explains social network structures and relationship building actions. Lin (2001, 3) defines capital as an "investment of resources with expected returns in the marketplace." Thus, social capital is an investment in social relationships with an anticipated return of relational dividends from such actions. Resources embedded in social networks and subsequently accessed and used by individuals in a network is the operationalized definition of social capital (Lin 2001, 24-25). One of the major resources one may access in their social network is information.

However, for understanding social networks as information networks, we will focus here on the concept of "tie strength" (Granovetter 1973, 1982 and Marsden and Campbell 1984). Granovetter's works examined information diffusion in social networks via informal social contacts, and in particular, in a job seeking setting. Strong ties are those to whom an individual has the closest relationships (i.e. family members and friends). Close ties are overlapping so that new information is most likely shared often and easily. In the Granovetter studies, the better information concerning jobs came from outside of one's close tie network. In particular, short, weak contact chains provided the best information. Marsden and Campbell (1984) posit methods for measuring "closeness" which they operationalized as emotional intensity as the best indicator of tie strength. Duration and frequency of contact were determined to be problematic as measures as subjects tended to overestimate the strength of ties in their networks for these two factors. The authors conclude that direct measures of tie strength, particularly that of closeness, be preferred when measuring tie strength in social networks. This study in particular holds promise for analyzing relationship building in virtual communities in developing a social network map for either egocentric or whole network graphic.

Information Exchange

The third tier of the analytic framework is the segment where communication within communities is addressed would broadly include current models and theories of information needs, information seeking, and information use in allowing researchers to study face-to-face and virtual communities. Information becomes a far more important commodity in virtual communities than perhaps is so in face-to-face communities. Communication is primarily composed of text information so other communicative cues, such as non-verbal language cues, are not available to aid in interpreting speech. Communication behaviors then are key to building strong and robust communities and information plays a crucial role in this process. While physical proximity is important in developing strong networks in face-to-face communities, it is not a factor in virtual communities. Psychological conditions play key developmental roles. Crickman (1976, 244-45) noted four important psychological communication situations:

1. People need a reason for being present at a site in order to interact comfortably.
2. People need to feel that entry and exit are unrestricted.
3. People converse more readily when they have more time on their hands.
4. People communicate more readily if they perceive that the strangers around them are neighbors.

In virtual communities, the issue of entries and exits is most likely achieved more easily than that of real life interactions. If, in point 4 we change the observation to "People communicate more readily if they perceive that the strangers around them hold a common interest" then this might apply more readily to virtual communities. Whether one conceptualizes others on the Internet as strangers, friends, acquaintances, etc. is often an individual perception.

An excellent article by Burnett (2000) not only delineates a communication typology for examining information exchange in virtual communities. This article also includes a good interdisciplinary literature review of computer mediated communication (CMC). The typology is quite detailed and lack of space limits a complete review of this work but the fundamental level includes non-interactive and interactive behaviors and then builds up through several levels to the information specific layer where announcements, queries for information and directed group projects are the catalysts for transforming some virtual communities from simple social gatherings to dynamic information rich environments.

The communication component of analyzing both face-to-face and virtual communities also includes important information need and information seeking aspects. Understanding communication patterns and purposes is an important factor in investigating human-information interactions.

Information Sharing

The top tier of the analytic pyramid is the most specifically focused. At this stage of the holistic model approach, the specific behaviors of information acquiring and sharing (IA&S) (Rioux 2004) truly are the main method in which relationships are born, grow and evolve in virtual communities. Rioux's work examines the behaviors and processes of the action of acquiring information and the subsequent act of sharing with others. His work includes analyzing the catalysts and motivators that lead to information acquisition and sharing. People acquire and share information based on a mix of cognitive, affective, motivational and procedural needs. Four themes emerged from the study:

> Theme 1: Respondents perceive a relatively low awareness of the cognitive states they experience during the process of sharing acquired information (Rioux 2004, 132).
> Theme 2: A quick cognitive evaluation state is evidenced (Rioux 2004,133).
> Theme 3: Respondents experience a varied mix of positive affective states during the process of sharing acquired information (Rioux 2004, 135).
> Theme 4: Respondents do occasionally experience negative affective states during the process of sharing acquired information (Rioux 2004, 139).

Informants in Rioux's study reported that they felt that their information sharing seemed rather "impulsive" and that they were motivated mainly by a sense of "fit" between the information acquired and the targeted recipient. Positive effects reported included the perception of the information sharing act as a "gift", making someone aware of social causes, good feelings about the person they were sharing with and the act of sharing, and

an overall feeling of satisfaction. Sharing information made informants feel "successful", "smart", "excited" and some felt the exercise was "fun" (Rioux 2004, 134-35). Finally, informants also reported occasional negative emotions while sharing information. One informant wondered if such behaviors evidenced a lack of self-esteem while others worried that they might be perceived as "boastful" and as a result experienced feelings of guilt and self-doubt (Rioux 2004, 139). Future studies need to examine the concomitant perceptions of information recipients in order to fully understand this top tier phenomenon.

4. Conclusion

In this brief overview of a proposed holistic analytic framework for analyzing information sharing and exchange in virtual communities both a broad conceptual framework and a more detailed analytic framework have been presented for consideration. Strong communities, both face-to-face and virtual are built on a robust foundation with strong building blocks. With a robust foundation in place, strong relationships may be built through the development and evolution of social networks. Individuals will be develop strong ties with some participants, weaker ties with others and these connections will evolve as well. Communication, affected through information exchange, is a critical component in building strong communities. And finally, information acquisition and sharing is basically the "coin of the realm" that is traded in the exchange process. Healthy and vigorous exchanges are seen in strong communities.

The analytic framework presented in this paper is a current work in progress and the authors anticipate continued development as other factors are identified. More inquiry into the act of receiving information is needed. Continued assessment of new theories in human-information interactions will also augment the evolution of what will be a dynamic and fluid model for analyzing virtual communities.

References

Burnett, Gary. 2000. Information exchange in virtual communities: A typology. *Information Research*, 5(4) Available at http://information.net/ir/5-4/paper82.html.

Crickman, Robin D. (1976). Community communication patterns. In M. Kochen and J.C. Donahue (eds.) *Information for the Community*: 237-248. Chicago: ALA.

Garton, Laura, Haythornthwaite, Caroline, and Wellman, Barry. 1997. Studying online social networks. *JCMC* 3(1).

Granovetter, Mark S. 1973. The strength of weak ties. *American Journal of Sociology* 78: 1360-80.

Granovetter, Mark S. 1982. The strength of weak ties: A network theory revisited. In Peter V. Marsden and Nan Lin (eds.), *Social Structures and Network Analysis*: Sage.

Gusfield, Joseph R. 1975. *The community: A critical response*. New York: Harper Colophon, cited in McMillan, D.W. and Chavis, D.M. Sense of community: A definition and theory. *Journal of Community Psychology*, 4: 6-23.

Lin, Nan. 2001. *Social capital: A theory of social structure and action*. Cambridge University Press.

Marsden, Peter V., Campbell, Karen E. 1984. Measuring tie strength. *Social Forces* 63: 482-501.

McMillan, David W. and Chavis, David M. 1986. Sense of community: A definition and theory. *Journal of Community Psychology*, 4: 6-23.

Rioux, Kevin. 2004. *Information acquiring-and-sharing in Internet-based environment: An exploratory study of individual user behaviors*. Unpublished doctoral dissertation. The University of Texas at Austin.

Rioux, Kevin S. (in press). Rioux's Information Acquiring-and-Sharing Framework. In S. Erdelez, Karen Fisher & Lynne McKechnie (Eds.), *Theories of Information Behavior: A Researcher's Guide*. Medford, NJ: Information Today, Inc.

Scott, John. 2000. *Social network analysis*. Sage.