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# FACTORS THAT INFLUENCE ONLINE RELATIONSHIP DEVELOPMENT IN A KNOWLEDGE SHARING COMMUNITY

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## Abstract

*The goal of this paper is to present a framework for factors that influence online relationship development and to discuss a preliminary study with an online research community on users' attitude towards new system features based on the framework. The article first introduces the motivation of this research, and then a framework for online relationship development is presented. A preliminary study was conducted with a questionnaire, which was distributed at the community annual research conference. The response is analyzed for initial feedback from users about system features designed to encourage online relationships development. Finally, conclusion and future work will be presented.*

**Keywords:** Interpersonal relationship, knowledge sharing community, social presence, social information processing, critical mass

## Introduction

In the 21<sup>st</sup> century, the Internet is not only an information sharing place. More importantly, it is a social technology that connects people together regardless of time and location limitations. Various kinds of online communities have evolved on the Internet as one of the outcomes of this new social technology. A group of people who share similar interests and exchange information and ideas via computer networks are called virtual community or online community (Rheingold 1993).

Communication is the essence of science; in some scientific fields, over 65% of publications are jointly authored. Scientists exchange their ideas within the scientific community; the product of this exchange is the dissemination of the new knowledge, new information, and the creation of new research ideas (Garvey 1978). Kraut et al. (1990) in their research also found that informal communication is an important mechanism to help achieve both the production goals and the social goals of groups. Computer mediated communication (CMC) has changed the structure of connections among scientists and the way of dissemination of new knowledge. However, it is erroneous to expect people to participate automatically in online community systems; also referred to as virtual environments or virtual publics (Jones 1997, Jones and Rafaeli 1999), after they are built (Andrew 2002, Brazelton 2002). Many online research spaces built on pull-based technologies (a website) have not been very successful – it is hard to sustain members (e.g. ChiPlace, Konston 2002). The main purpose of this study is to identify and explore factors that contribute to or inhibit online interactions in online research communities.

One of the direct outcomes of communication is interpersonal relationships. Before the Internet and computer networks, communications between scientists were usually through journal articles, annual conferences in the field or informal meetings in the local area. It was difficult to communicate with other scientists who had similar research interests but were located in a remote place. The degree of communication and collaboration was very limited because of spatial and time restrictions. Now, with the Internet, it is possible to communicate with people throughout the world. This also creates a good opportunity for scientists to communicate with each other in a much easier way.

Hiltz's (1984) study of scientific research communities using a computer conferencing system as a communication medium found that by using the system, scientists broadened their contacts with others in the same domain and increased their communication across disciplines; they gained a better understanding of others' work. Star & Ruhleder (1996) studied a geographically dispersed online community of geneticists. The results show that collaborations among scientists may take place across disciplinary or geographic boundaries.

Although theoretically the online space provides a promising opportunity for scientists to collaborate, in the real world this does not happen all the time. The question is "if you build a community, will users come?" "*Technology may support a knowledge sharing environment, but getting users to participate in effect ways is key*" (Brazlton & Gorry 2003, p23). Can we use technology to encourage the development of a research community? In the next section, a framework of factors that contribute to online relationship development will be presented. We are going to evaluate various factors in the framework by a field study with a research community, details of the research plan will be discussed in the "Field Study" section below, followed by the preliminary study based on current features.

## A Framework

Why are interpersonal relationships important to online communities? People who come to an online community are not just seeking information; more importantly, they treat it as a place to meet other people, to seek help, support, friendship, love, etc. In another words, they are driven to develop social relationships with other people inside the community. Thus, it is very critical for an online community to help its members establish interpersonal relationships. This is so crucial that it directly affects the satisfaction of its members, and satisfaction is a potential predictor of continued participation in the online community; from the system aspect, it is a crucial factor for the continued use of the system (Kiesler et al. 1985; Rockart & DeLong 1988). Although some theories conceptualize CMC as an impersonal and task-oriented medium (Hiltz et al. 1986, 1989; Rice 1984; Kiesler 1984; Connolly 1990), it is not impossible to make friends in online environments. People were found to establish friendships in Internet Relay Chat (IRC) (Reid 1991); in commercial online services (Van Gelder 1985); in virtual reality systems (Reid 1995); and also in asynchronous Usenet newsgroups (Parks & Floyd 1996). In order to identify factors that influence relationship development on online communities, media, community, and individual characteristics was reviewed to form the conceptual framework.

### *Media Aspect*

Based on social presence theory (Short et al. 1976), people communicating via computer mediated communication (CMC) has less capability to convey the presence of communicating participants. They perceive less communication context and interpret less meaning from the conversation. "*Without nonverbal tools, a sender cannot easily alter the mood of a message, communicate a sense of individuality, or exercise dominance or charisma*" (Kiesler 1986, pp.48). However, Korzenny (1978) proposed that communication through electronic media creates a feeling of greater propinquity with others, regardless of their actual geographic dispersion. Such "electronic propinquity" might be expected to foster friendships, as traditional propinquity is known to do (see also Walther 1992). Because of the text-base characteristic of the CMC environment, the awareness of other people in the community is very important to build the social presence. Systems that provide perceptually-based social cues which afford awareness and accountability are called "Socially Translucent Systems" (Erickson et al. 1999). Results from Erickson and his colleagues' study about socially translucent systems show that making people and their activities visible to others will potentially fostering learning, intuition and empathy; it will also foster feelings of responsibility and accountability as people become aware that others are "looking" at them.

Walther presented social information processing (SIP) theory to explain the difference between CMC and face to face (FTF) communication. SIP argues that the difference between the two media is rate. It states that social identity and relational cues can be transmitted by plain text, but this occurs at a slower rate than would occur in a richer channel such as voice, or face-to-face meeting. SIP predicts that over time computer mediation should have very limited effects on relational communication, as users process the social information exchanges via CMC. This theory tells us that when studying relationship development in CMC environment, we need to have a longer study interval to effectively observe social information exchange. A short-term experiment (1-2 weeks) is seldom effective in relationship development studies.

### *Community Aspect*

Community size and communication activities are undoubtedly factors that attract and retain members. Hiltz and Turoff (1978) first mentioned "critical mass" in relation to group size in the late 1970s. Markus (1987, 1990) explained this effect from the

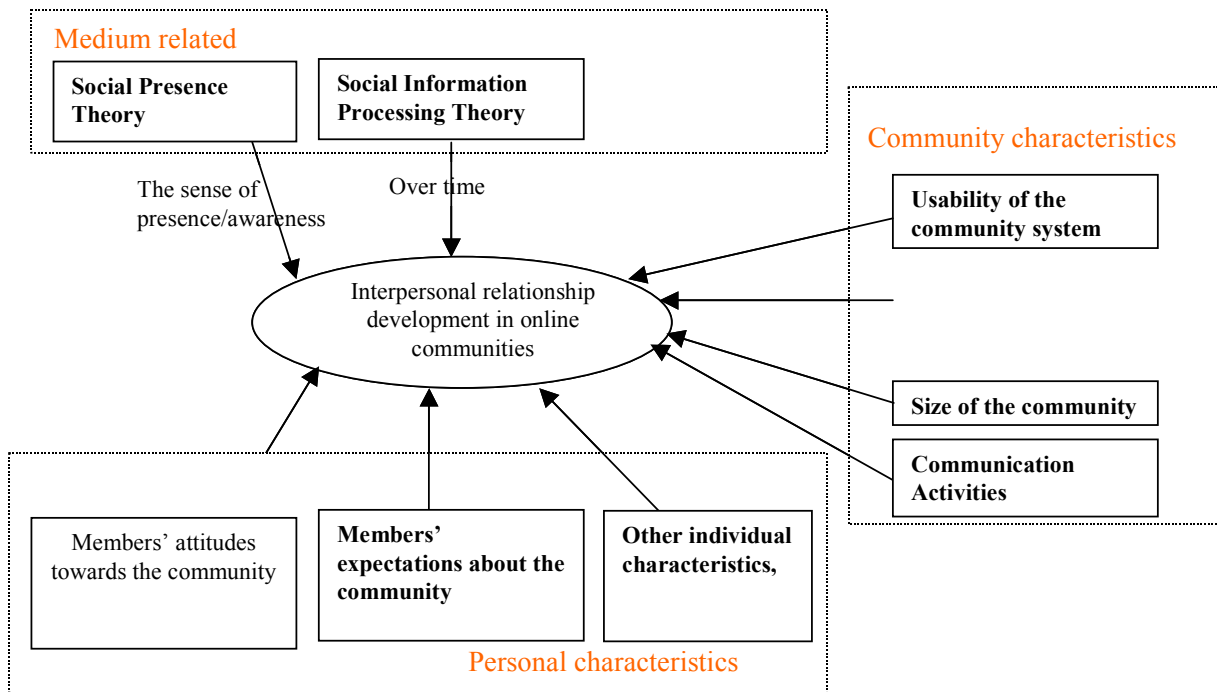
point of view of a new interactive medium. Any new interactive medium will suffer from cold start-up problems and discontinuity. From an individual point of view, when thinking about whether or not to adopt a new medium, it is very unlikely that a person will use it unless a sizeable number of his or her communication partners are already using it. Researchers have referred to this “sizeable number” as “critical mass” (Bair & Mancuso 1985; Culnan & Bair 1983; Hiltz 1984; Hiltz & Turoff 1978; Rogers 1986; Uhlig et al. 1979). For online communities, a community thrives only if there are sufficient people and enough activity to make it attractive and worth-while (Markus 1987, 1990; Morris & Ogan 1996; Rice 1994). Whittaker et al. (1998) use a common ground model to predict the effect of size and activities on the dynamics of mass interaction; their study shows a strong relationship between community size and conversational strategy. Jones and Rafeali (1999, 2000) studied the effect of critical mass, information overload, and social loafing on online interactions. They predict the upper limits of sustainable communication depend on the type of technology. Butler (2001) developed a resource-based model to present effects of community size and communication activities on community social structure sustainability. Schoberth et al.’s (2003) study extended the above studies with consideration of time. All these studies show that in online communities, a small minority of users always writes the majority of postings.

Usability of the community system, the volume and quality of information provided, and the timeliness of the community content are also factors that affect members’ engagement in the community (Preece 2000, Nonnecke & Preece 2000). If there is not enough information, people will not be interested to join; if there is no updated information, there is no reason for members to come revisit; if there is too much information, it may cause individual information overload, which may also frighten members away.

**Individual Aspect**

It is reported that lurkers make up the majority of members in online groups (Mason 1999). Nonnecke and Preece (2001) did a study to explore reasons for why lurkers lurk using structured interview. Their results show that most mentioned reasons for lurking includes individual factors such as willingness of anonymous, concerns of privacy and safety; shy about public posting, and limited time. Research also find that users’ skepticism towards the CMC environment (Utz 2000) and their expectation for the CMC environment (Hiltz 1884; Utz 2000) will influence their relationship development online.

Based on the discussions above, we present the following framework for developing interpersonal relationships online.



**Figure 1. Framework for Online Relationship Development**

From this framework, we can build features that increase the social presence in online communities, encourage people to participate online, and also create strategies to advertise the community and increase activity to help the community reach its critical mass and help members to reach their goals.

## A Field Study

In order to evaluate various factors presented in our framework, we are conducting a field experiment embedded within a field study on an online research community. The usage data of the community site will be logged, and a survey questionnaire will be distributed to members in the community to ask for user perceptions about the community and the system followed by a semi-structured interview with selected users. All these data will be analyzed to evaluate different factors in the framework and identify other factors if there are any. The community we are studying is the “Asynchronous Learning Networks (ALN) Research Community.” The overall objective of this community is to increase the quality, quantity, dissemination, and application of results of research on the effectiveness of ALN, a form of e-learning that combines self-study with substantial, rapid, asynchronous interactivity with others (<http://www.aln.org>). The community is hosted on <http://www.alnresearch.org>. Details about ALN Research community can be found in (Zhang et al. 2001). This community is a fairly small community which has over 150 members currently. The research community potentially consists of current researchers publishing in the field (a few hundred people) plus faculty members teaching online who are interested in the results, plus students enrolled in courses about online learning or Ph.D. candidates who are doing research in the ALN field. We estimate its potential usage to be 1000-2000 researchers and practitioners.

Several system features have been designed and implemented based on the factors in our framework; then we will measure the effectiveness of these features for the field site.

- Add more social cues: we implemented a member directory with photographs and video clips of interviews with top researchers.
- Add “commenting” function for each article in the knowledge base: In order to motivate members to start actively participating in the community (posting or contributing), a commenting function has been added for each article in the community knowledge base. Readers can have an instant access to the “comment” function from any page of information about the article – abstract, database analysis, full text.
- Increasing awareness of other members (will be implemented)
- Provide visibility of people and their activities: Adding social navigation (Dieberger 1997) information on knowledge based pages (when it has been visited last, how many times it has been visited) not only provides a way for members to recognize the most popular items easily, it also helps to increase the aliveness of the community itself. In addition, we also keep a record of the members’ activity inside the community, their postings inside the community; when they join the community; when their last visit was, etc. Some of this will be used to increase explicit “social presence” and some for analysis of user behavior.
- Provide close group information for a certain user: People can only keep in close contact with a small number of other people who share similar thoughts with them. The collaborative filtering (Konstan et al. 1997) technology that is used in recommender systems can help us to find people who are closely related to each other based on interests. A recommender system will be implemented in the community and the presentation of the recommendations will show other users in the community who share similar interests with a particular user.
- Increase activities in the community (will be implemented): In order to help the community to reach its critical mass, we are going to add an “other” category in the knowledge base which will accept all publications related to ALN research, in addition to the empirical studies from refereed journals now included in the knowledge base. This category will encourage members to contribute their own work and information they know about ALN research. It will also help to contribute to the freshness of community knowledge.
- Personalize presented information with a recommender system (will be implemented). In order to reduce the problem of information overload and provide more useful information for each user, a recommender system will be implemented to give personalized suggestions. Recommender systems are information systems that are designed to provide recommendations about goods or services to some specified population of people (Resnick & Varian 1997). The recommender system for ALN

WebCenter will present a particular user with information based on the user's preferences and suggested items from other users who share similar interests. With the recommender system, users should be able to find useful information easily, which in turn will help to turn lurkers into active participants.

### ***A Preliminary Study***

Based on the current features ("people directory" and "comment" function), we did a preliminary study to evaluate users' attitude towards the new features. The preliminary study is based on the on-site survey responses at the ALN annual meeting in Nov 2002. Research questions for this preliminary research are:

- RQ1: What is the perceived usefulness of adding social cues?
- RQ2: Will adding social cues help to encourage online relationship development?
- RQ3: Will the application that encourages active participation ("comment" function) encourage people's willingness to participate?
- RQ4: Will people expect to build online relationships in an online community?

Subjects volunteered to participate in the study based on their expressed interest of the annual meeting where we had a demonstration booth in the exhibit. Participants were given a brief demonstration of the web site first, and then they were given 20-30 minutes to try different features in the community site, at the end, they were asked to fill in the consent form and a short questionnaire. Because this is a totally voluntary response, we could not use a long questionnaire to measure our research questions, the questionnaire only include 11 Likert type scale questions and 4 open ended questions.

### ***Analysis and Results of the Preliminary Study***

#### **Effectiveness of Adding Social Cues**

RQ1 is measured by questions asking the perceived usefulness of adding more social cues.

- [5] I like to browse through the "people directory" to see who is in this community  
Strongly disagree 1 2 3 4 5 Strongly agree
- [7] The video clips of researchers talking about research issues give me useful insights.  
Strongly disagree 1 2 3 4 5 Strongly agree

Among responses to question 5, 45% (15 out of 33) of the responses are agree or strongly agree, 18% (6) of the people disagree with it. There are only 25 people who answered question 7 because of either technical reasons or time limitation. Among the responses, 36% of the people agree that the video clips give them useful insights, 16% of the people disagree, and the rest of people chose "neutral".

RQ2 is measured by the following question:

- [6] If I find someone in the people directory who shares research interests with me, I might contact them  
Very likely 1 2 3 4 5 Very unlikely

Among 31 responses, 74% of the people answer that they are likely to contact other members from the information they get from the "People Directory".

#### **Effectiveness of "Comment Function"**

RQ3 is measured by the perceived influence of the "comment" function on people's willingness to participate in discussion.

- [8] When I read through an article or a database entry from the paper list, it is very likely that I will click on the "comment" button and post my comment  
Strongly disagree 1 2 3 4 5 Strongly agree

Among 32 responses, 44% of the people agree that they are very likely to use the “comment” function and 22% of the people disagree.

RQ4 is measured by asking about people’s attitudes towards the online community and their willingness to get to know other people online.

### **Attitudes Towards Online the ALN Online Community**

Two questions are used to measure the attitude towards the online community.

[10] For me, the site is just a place where I can get some information, I won’t post anything or communicate with anyone through it.  
Strongly disagree 1 2 3 4 5 Strongly agree

Among 34 responses, only 26% of the people agree with the statement and 50% of the people disagree with it, which shows that most of the people are willing to communicate online.

[9] There is a great chance that people can collaborate through this virtual community.  
Strongly disagree 1 2 3 4 5 Strongly agree

Among 34 responses, 59% agree with the statement and 20% of the people disagree with it, which also affirms that most people are willing to collaborate online.

We also asked people whether they have ever made friends or collaborate with people online, 50% responded yes, and the other 50% responded no. When asked where they meet online, most answers are via listserv or email and some met through discussion forums.

### **Willingness to Get to Know Other People**

[11] I want to know who else is doing research in the same field as mine and want to communicate with them if possible  
Strongly disagree 1 2 3 4 5 Strongly agree

Among 32 responses, 66% of the people agree with the statement, and 19% of the people disagree with it.

## **Contributions and Discussion**

The major contributions of this paper are to present a framework for factors that influence interpersonal relationship develop online, and to present preliminary results of a test of the usefulness of the framework. Though much more data collection from users and potential users of the site will be necessary, the initial results are encouraging.

From our initial results, we can see that most people agreed with the perceived usefulness of the implemented features and expressed their willingness to make contact with other community members. Although there are some who give negative response to the effectiveness of the applications, we hope that by implementing features that will encourage online relationship development based on our framework, we can help the research communities to thrive and enhance collaboration among researchers.

Because this is a preliminary study, we did not complete all the system features that we proposed and also usage data and participation rates data need to be collected to test the relationship between each factors and relationship development.

In continuing this research, we will implement all proposed features and collect all web site usage data and postings on the site, and use an online survey to test effectiveness of each factor for online relationship development.

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