Using New Discoveries in Online Relationships to Enhance Social Computing in Work and Rural Environments

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One concept learned from HCI is that technology should not be deployed the same way in all environments – we should take what is known about humans and their social settings and adapt the technology to make products useful in specific contexts by specific audiences. This paper explores this concept with respect to social networking.

Introduction

Online relationships are the topic of much research and yet there is still so much to discover. The way in which humans interact with one another in the physical world is sometimes replicated online and sometimes entirely new and unexpected interactions take place that do not fit previously held assumptions. The introduction of the social network site, or SNS, changed the landscape of human interaction as did other technological advances in communication such as the telephone and Internet. And similar to what happened with the telephone and Internet, there is the temptation to use the technology in the same manner in all social settings, ignoring differences in social practices (Gilbert, Karahalios & Sandvig, 2008). This paper investigates some of the new discoveries with respect to online relationships and how these discoveries can be used to help make social networking more usable in work and rural environments.

Binary Friending, Incremental Trust and Tie Strength

In the world of social networking, someone is either your friend or a stranger – there's no in between. This is referred to as the binary friend-or-not model. If that same model were applied to the dating world, instead of dating for a while and incrementally building trust before becoming committed, two people would either not know each other at all or be going steady (Gilbert, Karahalios & Sandvig, 2008). Of course, in the real world, this doesn't happen – relationships come in a wide spectrum of intensities, something social scientists refer to as "tie strength". Strong ties are people in a position of trust, such as family and very close friends, and are important to one's emotional health. Weak ties are much looser acquaintances but should not be looked at with disdain; they are usually the most helpful in terms of spurring creativity and assisting in job searches (Gilbert & Karahalios, 2009). Yet, most social network sites do build on this knowledge and continue to operate on the binary friending model, leaving users to adjust their privacy settings to vary their friendship commitment level.

New discoveries: Research shows that certain variables such as intensity, intimacy, duration, social distance and demographics can be used to automatically evaluate a user's social network and predict strong and weak ties with 85% accuracy. Intimacy (measured by last communication, number of friends and intimacy words) and intensity (measured by wall words, outbound posts

and thread depth) turned out to be the largest contributors to tie strength, at 32.8% and 19.7% respectively. Surprisingly, Inbox thread depth (one of the intensity measures) was found to negatively impact tie strength – the more back-and-forth in an email thread indicated less, not more, of an intense relationship. One reason for this may be that people who are strongly tied communicate more efficiently and so do not need as much back-and-forth to get a point across (Gilbert & Karahalios, 2009).

Reparative Design in Social Systems

As with real-world human interaction, online interactions don't always go smoothly. On social sites, whether they are for friendship or business, users either intentionally or accidentally violate the law or rules of the community. One example of an intentional violator is a "troll" – someone who pretends to be in agreement with the community for a while but is really just waiting for the precise moment to stir up controversy by voicing opinions contrary to the community's beliefs. Another example of an intentional violator would be a seller who builds their reputation with a large number of low-cost transactions while waiting for the opportunity to commit fraud on a high-cost transaction. Examples of unintentional offenders are a seller who accidentally posts false information about a product and a community member that has an atypical lapse of judgment. Although, many social sites such as Etsy, eBay, Wikipedia, Yahoo! Answers, and Slashdot have systematically designed ways to discourage, penalize and block users who violate the rules, not enough work has been done to help repair damage and allow ***unintentional*** offenders to re-join the community (Vasalou, Riegelsberger, & Joinson, 2009).

New discoveries: Research shows that 5 system design principles can encourage forgiveness and lead to reparation: **1)** acknowledge the asynchronous nature of online communication by designing a workflow that informs offenders and allows a grace period for their response; **2)** acknowledge the motivating factors of forgiveness (such as offence severity, intent, etc.) by designing a workflow that allows members to clearly see documented proof of each other's actions, easily communicate verbally and non-verbally (avatars, emoticons) and express regret; **3)** acknowledge the educational benefit of mistakes by designing a system that rewards members for sharing their offence story with the rest of the community; **4)** acknowledge that forgiveness is

an optional choice by building enough flexibility so that decisions to forgive can be reversed; and **5)** acknowledge that victims often make incorrect assumptions about the reason for the offence by designing a system that preemptively alerts users to the most common causes for offences and retrospectively takes the offender's history into account to paint a more complete picture (Vasalou, Riegelsberger, & Joinson, 2009).

Recommenders: Gaming, Timing, Satisfaction and Algorithms

Users connect to social network sites to meet new friends, re-discover old friends or strengthen relationships with existing friends. Social network sites try to assist users with these goals by recommending people that may be of interest. However, making recommendations is not an easy, straightforward process. First of all, system designers must decide on the best criteria on which to base recommendations. Secondly, in the case of new users, their profiles may not contain enough information to make good recommendations. Furthermore, recommending friends has unique social challenges related to reciprocity and impression management that are not present when a system is simply recommending a book or DVD. For example, when adding friends, users are concerned about how the person being added will perceive the action and how their social network will perceive the friendship (Chen, Geyer, Dugan, Muller, & Guy, 2009). But it's to the benefit of the system designer to make the best recommendations possible, despite these challenges, since research has shown that when people are unhappy with system recommendations, they attempt to trick the system into providing better recommendations – called "gaming" the system – often with devastating results (Rao, Hurlbutt, Nass, & JanakiRam, 2009).

New discoveries: A study was done comparing 4 different friend recommendation algorithms: **1)** content matching, where the system looks for instances where two users have posted content on the same topics; **2)** content-plus-link, where the system looks for social links in addition to similar content topics; **3)** friend-of-friend, where the system only looks at the number of friends in common; and **4)** SONAR, where the system looks for social links across many systems like blogs, wikis, patent databases, friends, etc. The study showed that the algorithms based more on social relationships (friend-of-friend and SONAR) resulted in better user response and was better

at finding already-known friends. The algorithms based more on similarities in content (content matching and content-plus-link) were best at finding new friends (Chen, Geyer, Dugan, Muller, & Guy, 2009).

A separate study sought ways to increase user satisfaction with system recommendations and to prevent users from trying to game the system. The study's authors found that when users are presented with a photo of themselves during the profile building process, their self-awareness is increased. This self-reflection results in a stabilizing effect on the user's presentation of themselves to the system and increases consistency in the user's responses to profile-building questions. This same study found that when recommendations are presented after the user's profile is completely built – rather than presented intermittently during the building process – users are more satisfied with the recommendations, even if the recommendations are not that good. (Rao, Hurlbutt, Nass, & JanakiRam, 2009).

Conclusion

Since the goal of most social network site users is to discover new friends or interact with existing friends, the success of a social network will depend on how well it enables users to build their networks. In addition, research shows that group members continuously assess how useful a group is to them. To successfully retain members, social network designers must acknowledge the fact that the interaction between the social and technical features of a site heavily influences whether members consider the site valuable (Lampe, Ellison, & Steinfield, 2008). The recent discoveries in the areas of tie strength, recommender systems and reparation design for forgiveness can be used to appropriately design social networks for different environments, specifically in rural and work environments.

When a social network is used in a work environment, two common assumptions are: **1)** employees will be more focused on providing and gathering information rather than socializing; and, **2)** employees will interact more with their immediate colleagues. However, research has shown that the number one reason employees use internal social network sites is because they simply enjoy socializing at work; they also use it to advance their careers and find support for their causes. And, although they may initially connect to immediate colleagues, they decrease

that tendency over time and are most often seeking to find weak ties (DiMicco, Millen, Geyer, Dugan, Brownholtz, & Muller, 2008). Weak ties have been proven useful in career advancement and are useful for identifying new information that can spark creativity and lead to new lines of thought (Gilbert, Karahalios, & Sandvig, 2008). Based on this knowledge of how employees wish to interact, social network sites in work environments should employ the more socially based recommender algorithms (friend-of-friend and SONAR) that will find contacts that employees have some kind of connection with but don't know very well (DiMicco et al, 2008). This is contrary to what one might initially assume for a work environment, perhaps thinking that algorithms based on content would work better. A work SNS could also benefit from incorporating measures of tie strength – employees looking to find supporters for various work campaigns can send messages that are only routed through their strong ties since strong ties will often unite on common causes (Gilbert & Karahalios, 2008).

When a social network is used in isolated, rural environments, two common assumptions are: **1)** rural users will be less concerned about privacy because they're already so isolated; and, **2)** rural users will build friendships with people that are further away in order to escape their isolation. However, research shows that rural users are less trusting of people they meet on the internet and are more concerned with privacy than their urban counterparts. In addition, their social network friends tend to live very close by – rural users prefer to use social network sites to communicate with people they already have a strong relationship with. When they do desire to meet people outside their circle, trust is a big obstacle – perhaps due to the binary friend-or-not model most social sites use. Based on this knowledge of how rural people interact, social network sites that want to grow and retain their rural user base should employ techniques that allow incremental building of trust. This can be achieved through employing the recent discoveries in the area of tie strength to build privacy controls that have smart defaults and automatically adjust over time (Gilbert, Karahalios, & Sandvig, 2008). In addition, because of the distrusting nature of rural users and their tendency to form tight circles of trust with only local people, strong consideration should be given to systems with a reparation framework for forgiveness in order to prevent unintentional community offenders from being forever banished.

Of course, these discoveries are applicable in other practical ways that benefit all users but one of the great things about HCI research is the ability to use what is learned to exponentially benefit specific groups of users in specific contexts.

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