Investigation of Organizational Interaction and Support in an NGO through Computer-Mediated Discussions

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ABSTRACT
Discussion forums have been used to support organizational communication and have become a candidate for study of organizational behaviors. However, online behaviors of NGOs have been insufficiently studied compared to those studies conducted in education and industries. Our empirical study examined how social workers in one NGO used an internal discussion forum to help them disseminate time-sensitive employment opportunities for people with mental impairments, provide space for collective expressions of support, and enable sharing of information and experiences. The main purpose of the paper is to study a multifaceted assessment methodology to assess online discussion forums in an NGO. In this paper, we carry out a systemic set of assessment methods including network analysis, category analysis, and content analysis for evaluating online social software, and particularly discussion forums. The methods are used empirically to assess patterns of information sharing, social network, and peer support in an NGO.

Keywords
Assessment, NGO, Social Software

Introduction
Information technology definitely changes the whole world, but not everyone has a fair access to it. “Poor service for the poor” is a well-known saying in the area of social welfare. We now can rephrase it to say “Poor technology for the poor”. The information technology used by Non-Government Organizations (NGOs) serving the underprivileged is far less advanced than that of profit-oriented organizations (Currion, 2006). It is true that many online services are for free nowadays and considered by many people easy to use. However, it is not always the case for NGOs. First of all, different demographic groups acquiring a new IT skill often go through a different learning curve than in business or academia. Although technology is there, it is in general necessary to help the NGOs and humanitarian agencies adapt technology to their needs (Chang et al., 2010). For this and other reasons, the online behaviors of NGOs have been less addressed in the literature compared to other sectors (Kay 2006; Hall & Davison 2007; da Cunha & Orlikowski 2008). We were interested in understanding how virtual communication spaces can be used within an NGO to address potential opportunities and threats to the success to its programs.

Discussion forums are widely available computer-supported communication technologies that facilitate virtual interaction on the Internet. The number of discussion forums continues to increase powered by the growth of the World Wide Web. For example, Google alone hosted 4.3 millions of discussion forums as of August 2009 in almost every language, region, and category. In this paper, we examined how the social workers used a discussion forum to help themselves deal with organizational communications that they perceived as essential to their job functions. We conducted a three year project and participated in supported employment programs for people with mental impairments. Supported Employment is a well-defined approach to helping people with mental illnesses find and keep competitive employment within their communities. Supported employment programs are staffed by employment specialists who have frequent meetings with treatment providers to integrate supported employment with mental health services. Crucial needs of online communication among the participating NGO were identified as follows:

1. Job opportunity sharing and paperwork reduction: The legacy database was designed for regulating job coaches (job titles for the social workers in our research). Therefore, data contributed from job coaches is isolated from access by each other. A data sharing mechanism is needed to enable job coaches to benefit from the information sharing. A platform for job coaches to share job opportunity and improve the matching process is desired.
2. Mutual support among job coaches: Most supported employment programs for the mentally ill persons are operated under rehabilitation hospitals. As non-medical professionals and contract workers in medical settings, job coaches often find themselves isolated in the organizations they serve. Low job recognition of the mentally impaired trainees on the competitive workplace is constant frustration job coaches have to live with, which
creates tension, insecurity, and emotional burden. Information technology can facilitate support mechanism by establishing a platform for information exchange, knowledge sharing and social support.

3. De-stigmatization of mental illness: The major barrier toward employment of mentally impaired persons is the stigma for mental illness which devalues them and thus deprives them from contributing to the society. Supported employment enables the public to witness the fact that mentally impaired persons can work and be useful to others. Such narratives need to be told, recorded, and circulated to debunk deconstruct the myth about mental impairment. In fact, the success or failure of the NGO depends on such public awareness of social inclusion programs. The collective action of telling these stories by job coaches is possible via the intervention of information technology.

In addition to the obvious uniqueness in de-stigmatization, timely job opportunity sharing to place people with mental impairments in competitive jobs is also critical to the organization. An examination of its effectiveness through analysis of on-line communication would be important for other NGOs providing supported employment services to consider new practices. Emotional support is also a unique subject because social workers pay frequent visits to potential employers, community training workshops, and family of people they take care of. There is little time left for them to meet their colleagues face-to-face and share the joys and tears. This poses the need of analysis of on-line communication to see to what extent emotional support has been achieved.

Setting and the purpose of study

To address crucial needs of online communication, several types of social software were compared before reaching a decision to adopt a software environment. The only option of computer-mediated communication tool was email before the setup of discussion forum. In fact, an internal only blog was launched first. However, it was soon abandoned in a month because of the difficulty of finding someone to assume the authoring responsibilities in a busy NGO. In February and March of 2007, we conducted two focus group meetings with service providers in the NGO. The purpose was to explore whether there were common grounds regarding the existing problems and core requirements with regard to IT systems. In the second focus group meeting, we briefed the practitioners for 1.5 hours about the best practices of nonprofit technology used by the world top ten NGOs. After the two meetings, the on-line forum was identified as a requirement that may change the organization. Because none of them had expressed any particular preference about the discussion forum, Google Groups, a modernized discussion forum which can display multimedia in line and allow web pages to be created right inside the discussion threads, was used on a regular basis for disseminating time-sensitive job opportunities to colleagues, providing space for collective expressions of affection, and enabling sharing of information and experience.

The aim of this research is to analyze the use of a discussion forum to facilitate communications among social workers within an NGO. The hypothesis tested is that a discussion forum for social interaction increases the productivity of these workers in terms of paper reduction, timely information dissemination, and emotional support. Participation in the social network increases information integration and interaction and thus portends an enhancement of productivity in terms of job placement for disabled individuals.

Assessing the information flows and functioning of the systems is important to organizational efficiency and social welfare. Social interaction is measured by user traffic, categories of worker interactions, structure of interactions, and peer support. Unlike previous works that used single measurement methods (Kay 2006; Hall & Davison 2007), this paper proposes an assessment framework based on triangulation of traffic metrics, network analysis, categorization, and content analysis. The contributions of the paper include 1) examining an institute (NGO) that has received little academic attention in the literature, 2) the use of multiple assessment techniques to test the hypothesis and 3) discussing experiences, benefits as well as difficulties of increasing organizational efficiency even with the implementation of social software. We hope the multifaceted assessment methodology applied in this paper can stimulate discussion among the researchers of social welfare as well as general organizational studies.

This paper is organized as follows. We first consider some of the research foundations on discussion forums, and particularly those methods examining the use of discussion forums in organizations. We then describe the setting of our research study and the methods we used to analyze the forum data. We next discuss our findings in terms of the proposed practices. We conclude the paper by examining the research implications of the use of discussion forums to facilitate NGO programs as a computer mediated communication tool.
Research foundations

Kay (2006) surveyed an extensive number of articles and proposed a comprehensive metric for evaluating discussion forums for educational purposes. The metric was based on system collected statistics of user traffic, such as visits, time stamps, posts, and responses. A contribution of our work is that we extend the scope of assessments by adding social network analysis, category analysis, and content analysis so that the integrated metric materializes to fit the settings and interests of organizations with a special focus on information sharing, quality of sharing, and peer support. The strategy for the use of multiple methods and data sources (Mathison 1988) is employed to produce an evidence base for this study. Category analysis is to quantify the interactions of online discussions by their category rather than by the whole. This gives us a deeper understanding of their online behaviors through finer granularity. Second, social network theory (Scott 2000; Newman 2003; Carrington 2005, Eds.) is applied in order to identify the underlying interaction structure. Social network theory is an instrument to measure the structure of an organization, a community or a society. Social network analysis (SNA) assumes that the attributes of individuals are less important than their relationships and ties with other actors within the network. SNA leaves less room for individual agency and focus on the structure of the network. Social networks have been used to examine how organizations interact with each other (Gómez et al. 2008). Content analysis (Kember et al. 1999; Swain 2006) is employed to evaluate three attributes of online peer support, namely, reflection, propositional stances, and affective tones (Hall & Davison 2007). The degree of reflection demonstrated one’s depth of thoughts in challenging each other’s statements and attempting to make critical analysis. The propositional stances indicate one’s position taken in an argument or a stand on a given issue among the responses and the author of the original entry. The affective tone in produced content measures the extent to which offered support or exhibited destructive linguistic behavior is demonstrated.

With participation of more than thirty students in three years, our research was conducted in the form of service learning, a pedagogy that integrates domain specific research and experiential learning for university students (Sigmon 1979; Sigmon 1994; Furco 1996). It is essential that curriculum of service learning encourages students to apply what they learn in the classroom to enable NGOs to achieve more. Thus student research and curriculum can be integrated and opportunities for students to participate in communities can be more meaningfully created. The theme of service learning often presents itself in the context of action research (Friere 1970; Agyris, Putnam, and Smith 1985; Cornwall and Jewkes 1995; Baskerville 1999), the role of which helps us try to examine a local problem with a local point of view. Action research emphasizes creating communities of inquiry within communities of practice (Friedman, 2001). This means that both researchers and practitioners must redefine their roles and develop a set of common values, norms, terminology and procedures. One of the objectives of action research is to make the tacit knowledge of practitioners explicit so that it can be critically examined and possibly changed in order to understand the problems under scrutiny and implement interventions to solve the problem. Action research in essence integrates practical problem solving with theory building. Furthermore, the interventions in action research often involve researchers and participants in the position of equals. This gives us an in-depth perspective for observing online behaviors exhibited in online forums.

Assessing an online discussion forum

Research Settings

The setting for this research is a Taipei-based NGO with supported employment programs for people mental impairments. The NGO has no communications department or any intranet, like most of the NGOs in Taiwan. In April and May of 2007, we conducted two focus group meetings with service providers in the NGO. The purpose was to explore whether there were common grounds regarding the existing problems and core requirements with regard to IT systems. In the second focus group meeting, we briefed the practitioners for 1.5 hours about the best practices of nonprofit technology used in the world top ten NGOs. After the two meetings, the on-line forum was identified as a genuine requirement that may change the organization. Google Groups was used as an online, internal only forum. None of the NGO’s senior executives were invited to register for this forum. The participating job coaches and the only one supervisor felt that it was secure to post to the forum. Except for two job coaches who preferred to use real identities, all the other participants used aliases when they posted or replied to discussions. Email addresses and true identities were collected in an off-line address book during enrollment. Although most participants of the online forum use an alias, their true identities can be recovered by email addresses that appear in each posting.
The objective of the forum is to fulfill the three needs as stated in the introduction: (1) job opportunity sharing and paperwork reduction; (2) mutual support among job coaches; and (3) de-stigmatization of mental illness. The employees of the NGO were expected to participate by posting and reading voluntarily on a regular basis. Fifty-one users participated in the discussions in the observed periods from Apr. 2007 to Mar. 2009. The population size reflected that it was a small study within an organization of social workers who dedicated themselves to maximizing employment opportunities for individuals with mental impairments. The culture there was very team-centric because a successful placement of individuals with mental impairments involved social workers, employment specialists and treatment providers. Field use of the discussion forum over a period of two years generated the dataset that we collected as a basis for knowledge discovery.

Data collection

Access to the NGO’s discussion forum was granted to the authors at all times during the research. As a common practice of action research, the participating social workers recognized that the content of the discussion forum was to be used as data and studied by investigators. The primary data consisted of archived postings and replies, supplemented with key interviews. This study follows in the tradition of research studies that focus primarily on electronic data (Wasko & Faraj 2005). Six interviews were conducted after all the empirical data analysis was completed to help us interpret the outcome of the research. The interviews were conducted with two participants who were major posters to the discussion forum, and four participants who occasionally posted but “lurked” extensively on it. In addition, focus group and participatory observation (Spradley 1979, Emerson 1983, Kvale 1996; Baskerville 1999) helped us to become oriented in the supported-employment NGO setting during the time period of research.

Overview of collected data

We evaluated the discussion forum according to the traffic-centric metric (Kay 2006), as shown in Table 1. It was observed that 44 members initiated at least one topic. The number of unique subjects was 409 which contained 950 postings, some of them being replies to particular subjects. One hundred and seventy of 409 topics received replies, which was 43.2%.

The NGO has a bulletin newsletter to distribute employment opportunities for job coaches to choose for their mentally ill trainees. Unfortunately, the newsletter is issued biweekly due to staff workload. Some available openings can become closed before the newsletter arrives at job coaches. The average 65.1 hours of message time span with SD=46.4 hours means time reduction in job bulletin delivery from an average of one week to an average of less than 3 days.

Although traffic analysis indicates activity intensity levels, it provides little information about the underlying social network, their relationships and ties with other members within the network. To gain further insights from the perspective of network structure, social network analysis (SNA) is applied in the next section.

<table>
<thead>
<tr>
<th>Index</th>
<th>mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Members (as of Mar. 2009)</td>
<td>51</td>
<td></td>
</tr>
<tr>
<td>Members who initiate topics</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td>Topics</td>
<td>409</td>
<td></td>
</tr>
<tr>
<td>Replies</td>
<td>541</td>
<td></td>
</tr>
<tr>
<td>Topics with replies</td>
<td>170</td>
<td></td>
</tr>
<tr>
<td>Total messages (topics+replies)</td>
<td>950</td>
<td></td>
</tr>
<tr>
<td>Time span per topic</td>
<td>65.1 hr</td>
<td>46.4 hr</td>
</tr>
</tbody>
</table>

Network Analysis

Network analysis (Scott 2000; Carrington 2005, Eds.; Gómez et al. 2008) focuses on how the structure of ties (or linkages) in a social network affects individuals and their relationships. Traditionally, socialization into norms is believed to determine human behavior in networked organizations, network analysis is to determine the extent to
which the structure and composition of ties affect norms. Therefore, network analysis gives a perspective of structural study into online interactions of the NGO we studied. Network analysis based on the replies between members is shown in Figure 1.

Replies are a form of interaction online communities can exhibit as a social network. Network analysis with respect to replies indicates the strength of interactions among members of a community and identifies clusters whose intra-interactions are stronger than interactions with members outside the cluster. Strength of interactions between members is measured according to the sum of replies a member writes to and receives from others. In Figure 1, the maximum sum is 204 while the smallest is 4. Five different sizes of circles are therefore used to stand for five classes of members whose sums of outgoing and incoming replies range from (1) 0~40 (2) 41~80 (3) 81~120 (4) 121~160, and (5) 161 and above. It is noted that member 1 and member 10 both have 9 members who write replies to them, indicating the highest centrality in the network.

Cluster identification is made by removing members from the network if their sums of replies are no larger than 80, i.e. less than 4 per month in average. The result is shown in Figure 2 where we see a clique of size 5. There are
bilateral interactions between every two members except the directed links from member 10 to member 1, from member 10 to member 2, and from member 4 to member 10. Therefore, we see that the core members of the network themselves have quite strong connections with each other, which can be interpreted as a force to tightly knit all the members together to form the social network we studied here. The findings are consistent with a previous research result that has shown that participation in online social networks is often unevenly distributed (Butler, Sproull, Kiesler, & Kraut, 2002). There is often a core group of participants who contribute most actively to the messages and to the running of the online social network, a peripheral group of participants who occasionally contribute a response or comment but rarely participate in the running, and a marginal group (often referred to as “lurkers”) who read but almost never post messages, and do not participate at all in management.

Social networks have been used to examine how organizations interact with each other. Social network analysis (SNA) assumes that the attributes of individuals are less important than their relationships and ties with other actors within the network. In other words, SNA leaves less room for individual agency and focus on the structure of the network. Traditional social scientific studies assume that it is the attributes of individual actors that matter. In the next section, we examine three attributes of discussion threads based on content analysis.

Content Analysis

To further investigate job coaches’ online social behaviors, we examined the characteristics of the discussion content with regard to depth of sharing and peer support. In light of the work by Hall and Davison (2007), the research questions were (1) the degree of reflection job coaches demonstrated in challenging each other’s statements and attempting to make critical analysis, (2) the propositional stances job coaches took between general agreement or disagreement among the responses and the author of the original entry, and (3) the affective tone in produced content ranging from offered support to exhibited destructive linguistic behavior. To extract the data from the discussion forum, we used content analysis, a technique common in the assessment of online interactions and one which has been deployed in other studies of social media (Kember et al. 1999; Swain 2006; Hall & Davison 2007). To study the effects of social support among participants, the focus of content analysis was on the replies rather than the main entries themselves. The unit of analysis we used is a whole comment.

The content coding scheme used in this study is summarized in Table 2. According to this scheme, the content of replies was characterized by the three independent dimensions. For example, a disagreeing reply with reflective thoughts and positive tones is coded as RDP, which stands for “Reflective, Disagree, and Positive” in terms of reflection, stances, and tones. The intention of the analysis was to reveal any emergent correlations among three attributes of replies collected in the dataset.

The affective dimension was generally quite straightforward and lent itself to comparatively easy classification. The affective tone can be positive, neutral or negative depending on whether the content is presented with a supportive tone, in a hostile manner, or with a neutral affection. To study the propositional stance, probing the range of agreement and disagreement requires more careful judgment and involves the researchers reading between the lines. The boundary between reflection and non-reflection was somewhat blurred for some occurrences of replies. Therefore, basic rules of good practice in coding (Fielding, 2001) must be adhered to. When problems or ambiguity arose, the context of the original entry was checked and a comparison of other similar cases was made to resolve the coding issue. Two researchers conducted independent analysis on the same dataset and the results were cross-examined. If there was any inconsistency, the individual items were retrieved for discussion and recoded on the consensus of the two researchers. For example, the statement “I think your opinion is insightful. What the employers really want is productivity. Therefore, the pre-service training got to be up to a high standard.” is judged as reflective by one research but non-reflective by the other. If they disagree, we need a third independent judge. The degree of care enhanced the reliability of the coded output and confidence in the process of conducting statistical analysis towards research findings.

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Code</th>
<th>Interpretation</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reflection</td>
<td>C</td>
<td>Context-free replies made out of the context of the original entry</td>
<td></td>
</tr>
<tr>
<td>U</td>
<td>Non-reflective replies made without demonstrating perceivable reflection on the original entry</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2: The three dimensional coding scheme
There were 541 comments rated by 2 researchers on the three dimensions: reflection, propositional stances, and affective tones. In order to assess the inter-rater consistency, we used SAS 9.0 to calculate Kappa coefficients. The statistical reliability evaluation results are shown in Table 3. The three dimensions display a Kappa coefficient of 0.8478, 0.7490, and 0.7369, respectively, indicating that the rating had attained a fairly high level of reliability and evidence validity was confirmed.

The attribute-by-attribute coding results were recorded in Table 4. We found that the discussion forum has demonstrated highly supportive online environments for the participating members. Replies with positive tones are as high as 94% and stances showing agreement are 92% across all the five categories in the small population we studied. The affective dimension is considered supportive and positive according to the data. Therefore, “emotional support” was achieved and evidence of the supportive culture was confirmed. In the propositional stance, thirty-seven of the 43 replies with disagreement or mixed responses actually came from the category of learning of IT skills. An investigation into the content reveal that some of the social workers do not trust technology as they witnessed misuse of technology on the less privileged people in their experiences of social services.

Table 3: Reliability measurement (Kappa coefficients), N=541

<table>
<thead>
<tr>
<th></th>
<th>Kappa</th>
<th>Asymptotic Standard Error (ASE)</th>
<th>Test of H0: p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reflection</td>
<td>0.8478</td>
<td>0.0331</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Propositional stance</td>
<td>0.7490</td>
<td>0.0366</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Affective tone</td>
<td>0.7369</td>
<td>0.0419</td>
<td>&lt;.0001</td>
</tr>
</tbody>
</table>

Table 4: Content analysis and statistics (N=541)

<table>
<thead>
<tr>
<th></th>
<th>Reflective</th>
<th>Propositional stance</th>
<th>Affective tone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reflective</td>
<td>125 23%</td>
<td>Agree 498 92%</td>
<td>Positive 508 94%</td>
</tr>
<tr>
<td>Non-reflective</td>
<td>383 71%</td>
<td>Mixed 40 7%</td>
<td>Even 33 6%</td>
</tr>
<tr>
<td>Context-free</td>
<td>33 6%</td>
<td>Disagree 3 1%</td>
<td>Negative 0 0%</td>
</tr>
<tr>
<td>Total</td>
<td>541 100%</td>
<td>541 100%</td>
<td>541 100%</td>
</tr>
</tbody>
</table>

Reflective replies are less than one-fourth. Although reflective expressions of thoughts can raise the levels of discourse quality, composing reflective messages usually takes more time and effort to think than those that are not reflective. The social workers unanimously experience tight schedules and this is not uncommon for employees in the ever-restructuring NGO sectors. Still, some are willing to contribute reflective thoughts for other practitioners to think deeper about field plans, actions, and experiences. Although the administration category receives the most numbers of original postings and replies, reflective replies are less than 1%. We see that 44% of reflective replies go to the “emotional support” category while another 38% go to the category of “Learning of IT skills.” We saw reflective empathy ranging from feeling a concern for other people that creates a desire to help them, experiencing emotions that match another person's emotions, removing painful emotions from another, knowing what the other person is thinking or feeling, and so on.

An interesting question is whether reflection relates to personal identities. If it does, then the sample is biased and the results observed in our study may not be reproducible elsewhere. Since the study does not use a random sample, an independence test is required in particular. Furthermore, this paper is based on one group with small population. Therefore, it is critical to examine whether the sample is biased. The statistical validation of data samples was not
used in previous studies of content analysis (Hall & Davison 2007). We study (1) the relation between persons and the number of reflective replies they compose, and (2) the relation between persons and the number of reflective replies they receive. For both investigations, there is no statistical difference according to the test of normality, i.e. Kolmogorov-Smirnov test, indicating a good fit ($p>0.1$). Therefore, there is no difference between the distribution of the data set and a normal one. Furthermore, peer support offered to colleagues in terms of affective tones and propositional stances does not show statistically significant interactions with personal identities. Again, it indicates that there is no difference between the distribution of the data set and a normal one when evaluating to what extent identities affect peer support. It is confirmed by the raw dataset with more than 90% of replies with positive tones and replies showing agreement. Therefore, the culture of the discussion forum is largely supportive with individuals maintaining positive affection and avoiding disagreement.

**Performance by Categories**

To gain deeper insights into social interaction, discernable difference among subject types of online discussions is investigated. According to subject categories, messages that we studied can be categorized into 5 types: (1) general information sharing, (2) job opportunities, (3) emotional support, (4) learning of IT skills, and (5) administration. Earlier we facilitated computer workshops for social workers and NGO staff to adapt technology such as GMail and Skype to their needs. Those workshops stimulated their interests in learning latest IT skills so we include “learning of IT skills” as one type of themes. Statistics of the five categories are summarized in Table 5, including number topic items, number of replies, number of topics with replies, elapsed time between original postings and the first replies, if any, (response time), and elapsed time between original postings and the last replies, if any, (lifespan).

The administration category receives the most numbers of original postings and replies. It reveals that the NGO uses the discussion forum in their daily administrative matters most. It can be effective in paperwork reduction and information dissemination efficiency. The number of topics about learning of IT skills is the second highest. It is somewhat to our surprise that social workers, who didn’t receive much IT training in their careers, exhibit substantial interests in learning the latest trends of information technology and applications. Topics in the category of emotional support receive the highest percentage of replies. The discussion forum has been perceived as a reciprocal channel of showing concerns, support and care among the members.

**Table 5: Performance statistics by category**

<table>
<thead>
<tr>
<th>Category</th>
<th>Postings</th>
<th>Replies</th>
<th>Postings</th>
<th>%</th>
<th>Response with replies</th>
<th>Life span (min.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>General information sharing</td>
<td>55</td>
<td>29</td>
<td>15</td>
<td>36</td>
<td>2866</td>
<td>4231</td>
</tr>
<tr>
<td>Job openings</td>
<td>77</td>
<td>99</td>
<td>33</td>
<td>52</td>
<td>22</td>
<td>3422</td>
</tr>
<tr>
<td>Emotional support</td>
<td>74</td>
<td>88</td>
<td>44</td>
<td>60</td>
<td>2712</td>
<td>5620</td>
</tr>
<tr>
<td>Learning of IT skills</td>
<td>81</td>
<td>133</td>
<td>37</td>
<td>42</td>
<td>3994</td>
<td>7430</td>
</tr>
<tr>
<td>Administration</td>
<td>122</td>
<td>232</td>
<td>63</td>
<td>51</td>
<td>637</td>
<td>7907</td>
</tr>
</tbody>
</table>

**Discussions**

The results of the study related to the functioning of the NGO in terms of paper reduction, peer support, and timely information dissemination, and particularly increased rates of job interviews. Table 6 summarizes main findings discovered in each method used in our study. The setup of such social software systems was quite straightforward and of minimal cost. However, to be successful an NGO needs to implement policies about online social interaction. Specifically, privacy issues need to be concerned with. The organization should make a clear statement on what could be written down on the system and what should not. When should the alternative communication tool be used that can help the system functioning better with privacy concerns? Information overload is an increasing problem in most workplaces. In fact, the interviews revealed that receiving irrelevant emails frequently was a major driver for the social workers to adopt discussion forums. NGO should encourage their staff to discern among the multiple communication tools existing simultaneously within the organization. For example, people use email frequently
when in fact blogs or forums should be considered in some occasions, such as making announcements or disseminating information to a large group of recipients. Careful use of communication tool will generally cut back the overload. These are among the issues to be considered in policy making when introducing new communication tools to organizations. Research findings also show that discussion forums are one of the appropriate tools in terms of peer support. However, communications in virtual spaces are only a small part of their life styles. There are still many occasions of emotional support that have to be delivered face-to-face or at least over the phone.

Table 6: Main findings in each method used in our study

<table>
<thead>
<tr>
<th>Data</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic Analysis</td>
<td>activity intensity levels of online discussion</td>
</tr>
<tr>
<td>Social Network</td>
<td>a core group, a peripheral group, and a marginal group</td>
</tr>
<tr>
<td>Content Analysis</td>
<td>the discussion forum is highly supportive; some replies are reflective</td>
</tr>
<tr>
<td>Category Analysis</td>
<td>the discussion forum has been perceived as a reciprocal channel of showing concerns, support and care</td>
</tr>
</tbody>
</table>

In the beginning, we found the category of job opportunities exhibited the lowest rate of replies, a fact that was a little disappointing. To find out the reason, we conducted a series of interviews with the social workers, namely, the job coaches. They were excited when they were enabled to receive new job opportunities in the discussion forum. The visit frequency of messages in this category confirmed the enthusiasm at the early stages when the discussion forum was newly launched. It turned out gradually that the job openings flowing from the Council of Labor Affairs into the system were not categorized properly and therefore rarely prioritized persons with mental disabilities. Furthermore, most of the leads that appeared useful did not result in successful job interviews for their trainees. Therefore, the job category became less effective over time. The other reason why there was the lowest number of reply rates was due to ethics issues. Discussion of details about job openings may often involve sensitive issues and therefore the social workers would rather conduct the discussion over the phone in private.

To overcome the usefulness issue, the NGO changed the source of job openings to a clearinghouse maintained by an alliance of NGOs where job openings were better organized. Since job coaches were hesitant to discuss job openings for their disabled clients over the system because of privacy concerns, a Skype component was embedded by the system to each posting of job openings so that they could choose to talk over the phone instead of writing down text. The Skype use was considered a reply and counted by the system. Later, the rate of replies on the job opening category rose to the second place. Due to the timely dissemination of useful job openings facilitated by the system, the number of interviews almost doubled a year after the introduction of the system. The job coaches did not think the discussion forum took extra efforts due to two reasons. First of all, the information service contributed to achieving the objectives of the NGO in a positive direction. Second, the use of RSS syndication in discussion forums appeared easy to use and working for them. They didn’t bother to check in the discussion forum several times a day on the desktop or mobile phones; they simply let the RSS notify them when job openings showed up.

Limitations and future work

The study was based on a sample of 51 job coaches. First of all, the number of job coaches dedicated to supported employment for persons with mental disabilities in Taipei City (population 2.5 millions) has been below 100 in recent years. Because of the small population, a Kolmogorov-Smirnov test was applied in order to justify the outcome of statistical analysis. Second, access to content of NGO internal communications, especially those involved in providing services for persons with mental impairments, is very limited. It would be interesting to apply the set of assessment methods in investigating other important NGO areas with larger sample sizes. However, content analysis is labor intensive and its scalability to large amount of content is challenging.

Conclusions

Traditional site traffic analysis based on site visits, page views, number of posts, and length of stay provides only limited insights into human communication in the NGO of our case. We developed a comprehensive assessment method of gauging social software performance by network, category and content analysis. Network analysis
measures the connectedness of the social network. Performance by category reveals the most effective and ineffective subjects that users participate in. Content analysis helps implicit organizational culture surface and emerge. The integrated assessment gives a more comprehensive perspective of the organizational behavior in the social service group we studied.

Research implications of the use of discussion forums to facilitate NGO programs as a computer mediated communication tool are mixed. Given limited resources in most NGOs, computer mediated communication can be beneficial to paper reduction, timely information dissemination, and emotional support. In addition, insufficient human resource often puts NGO staff in extreme work burden, which may force them to diminish the use of computer mediated communication as it is often interpreted as extra efforts. Furthermore, the needs of NGOs have been largely underserved by the ICT industries compared to other sectors. To change their attitudes towards computer use, the information service should prove relevant to their job functions and meet the objectives of the NGO in a positive direction. Inviting them to participating in the decision process, instead of just in the test stage at most, is also critical. The respects they received and felt through participation help build mutual trust between researchers and practitioners as well as change attitudes towards a new information service. This can further decrease the level of resistance to familiarizing themselves with computer skills which, paradoxically, may be of help to the individuals and organization as well in the end.

References


