Assessing Online Behaviors through Discussion Forums in NGO's Daily Working Life

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Abstract- **Traditional site traffic analysis based on site visits, page views, number of posts, and length of stay provides only limited insights to online human behaviors. The focus of the paper is to develop a systemic metric for evaluating online social software, and particularly online forums. In the context of NGO sectors, the metric materializes to fit the settings and interests of the organizations with a special focus on the forum's values on human behaviors such as information sharing and peer support.**

Keywords: Employment services for the mentally impaired, NGO, Performance evaluation, Human behaviors.

I. INTRODUCTION

Information technology definitely changes the whole world, but not everyone has a fair access to it. Profit is often the main concern of those technology giants. Advanced technology opens the door to creating new possibilities for the general public or just leads to the making of a few rich persons in the world. "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". A shortage of resource is often experienced by the social and welfare institutions because their service focus is on the poor rather than the opposite. It is the reflection that leads us to study the IT solutions for the nonprofit organizations, especially for the technological needs of social workers. Comparing to profit organizations, the technology used in serving the poor in nonprofit organizations has been so far behind. However, recent research on helping the poor with technology has been increasingly developed.

Our research is interested in service learning [1, 2, 4], a pedagogy that integrates domain specific research and authentic learning. It is essential that curriculum of service learning encourages students to apply what they learn in the classroom to enabling NGOs to achieve more. In this case, we work with a NGO that provides supported employment services [7] for people with mental disabilities. Persons with mental impairments tend to be viewed as unemployable and systematically excluded from labor markets. However, this assumption has been challenged recently after the development of community rehabilitation, and supported employment services in particular. With sufficient and appropriate support on the job, many people with mental illness are capable of participating in the world of work to various levels, which not only provides them with financial support but also opportunity for social connection. In other words, employment service that allows persons with mental illness plays a key role in the process of social integration for the mentally ill persons [6,7,8].

There are eight supported employment programs in Taipei, Taiwan in 2006-8 funded by the Taipei City Government through a NGO-government partnership [16]. Four programs have agreed to participate in this NGO project. It is not hard to soon realize that coordination of supported employment services to those who are less privileged is complicated given challenging goals, scare resources and social workers that come from varied institutes and may have their own agendas.

The study in this paper has been conducted around the theme of service learning which often presents itself in the context of action research [1-2, 4, 14], trying to solve a local problem with actionable plans and involving researchers and participants in equity positions. Technology can be one form of intervening to make changes and aim for improvement. Through one year of problem diagnosis and action planning, an online forum was introduced to the supported employment NGO with 29 social workers and one supervisor from the four rehabilitation programs.

The focus of the paper is to develop a systemic metric for evaluating online social software, and particularly online forums. In the context of NGO sectors, the metric materializes to fit the settings and interests of the organizations with a special focus on the forum's values on information sharing and peer support.

The rest of the paper is organized as follows. We describe the background of supported employment services and the process in Section II. Requirements of information systems are analyzed

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next in Section III. Section IV introduces the forum used by the NGO with performance evaluation. In Section V we present the discussions regarding the assessment. We conclude the paper in Section VI.

II. BACKGROUND

Employment services for the mentally ill persons in Taiwan have gained full momentum after the revision of the Disabled Protection Act in 1997, in which affirmative principle for disabled persons is applied to the practices of labor market, ie. all employers are required to hire at least one percentage of disabled persons among all employees. The accumulated penalty by employers for their insufficient employment of disabled persons becomes a major source of funding for the development of employment services for disabled persons, including the mentally ill. Among the various types of employment services, supported employment is seen as the most revolutionary with its emphasis on situational evaluation and training on actual work sites, rather than training in the classroom before placement. This shift of service logic from training-before-placement to placement-then-training in supported employment has been proved more effective than sheltered employment and job training in terms of working hours and income[7][8]. There are four reasons for that. First, resources are directly devoted to locating and stablizing the job for the trainee. Second, actual job situation allows the job coach, position title of a social worker providing supported employment services, to develop more concrete strategy to solve the problems on the work site. Third, the job opportunities developed by supported employment can be tailored according to the preference of the trainee. Fourth, supported employment provides on-going and on-job support which can detect and solve the problem more on time than other types of service. Given its importance in psychiatric rehabilitation, supported employment service is chosen to see how technology can be applied to improve its efficiency and effectiveness.

The process of supported employment can be divided into three stages:

1. Stage One: Locating employment opportunities and matching with trainees

Job coaches use various sources of information to locate potential employers for trainees. The often-used sources include official list of employers published by the Bureau of Employment Training, personal connections, newspaper advertisements, employers who currently hire persons with mental illness. As a highly stigmatized illness, persons with mental illness are often the least desired candidates for employers. Therefore, job coach needs to be persuasive to the employer with well-prepared list of documents. After locating a job opportunity, job coach will conduct job analysis to determine the types and level of skill and ability required by doing the job him/herself. After the job analysis, job coach has to find the appropriate trainee who is most likely to succeed. If there is no trainee who can fit the job, the coach will have to release the opportunity to other coaches. If the match is not completed in a short time, the job opportunity may not be available and the effort of job coach will be wasted.

2. Stage Two: Interview and preparation

Once the job match is confirmed, job coach will begin to prepare the trainee for interview, provide necessary travel instruction and accompany the trainee to interview on appointed schedule.

3. Stage Three: On-job support

Once the trainee begins to work, the job coach will provide different level of support according to the evaluation of job adjustment. In the beginning, the coach will provide intensive support and then cut back his/her involvement gradually until the trainee can handle the job independently.

Current Usage of Information Technology

The purpose of existing information technology for job coaches in supported employment is not to assist their work but to monitor their progress. Once the job coach has successfully located a job opportunity, s/he has to file a form and submit it to a database developed by the Council of Labor Affairs (CLA). Although the data contains information of all job opportunities for disabled persons, this database does not allow job coaches to share these opportunities among themselves. The possibility of matching between job opportunity and trainees efficiently through information technology is thus deprived. The efforts that job coaches devoted to persuading employers to hire mentally ill persons are likely to become fruitless, due to the lack of information sharing in current database. To compensate this shortage, the Bureau of Labor Affairs in Taipei City has set up a substitute of job opportunity sharing that is operated through fax and updated every other week. Secondly, since job coaches shuttle between various workplaces, the geographic distance hinders the coach from providing effective, on-site and in-time assistance to both trainees and employers.

III. Requirements of Information System

We aim to deliver a user-centered information system to the NGO using soft systems methodology [9-11]. In-depth interview, field study, focused group, and participant observation [5, 12, 13, 14] are adopted to collect data to analyze the needs of the front-line job coach.

Three types of needs among job coaches are identified as the directions of our follow-up prototyping:

1. Job opportunity sharing and paperwork reduction: Current database is designed for regulating job coaches. A cross-database mechanism is needed to enable job coaches to benefit from the information sharing. Technology should be aimed to empower front-line workers not the other way around. A platform for job coaches to share job opportunity and improve the matching process is needed.

2. Mutual support among job coaches: Most supported employment programs for the mentally ill persons are operated under rehabilitation hospitals. As non-medical professionals in medical settings, job coaches often find themselves isolated in the organizations they serve. A channel for mutual support among job coaches is thus urgently needed. Currently the job coaches for the mentally ill persons meet with each other once a month and communicate via emails. Information technology can facilitate such 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 for the mentally ill persons is the stigma for mental illness which devalues them and deprives them from contributing to the society. Supported employment enables the public to witness the fact that mentally ill persons can work and be useful to others. Such narratives need to be told, recorded, and circulated to deconstruct the myth about mental illness. The collective action of telling these stories by job coaches and even trainees themselves is possible via the intervention of information technology.

An online forum is configured to fast disseminate time-sensitive job information to colleague job coaches. For the new blood of the job coaches, experience and knowledge of senior coaches have been hard to be learned and passed on. The reason behind the difficulties is the traditional system using nothing but text in the trainee records. The discussion board combines pictures, video clips and narrative words in a holistic way to archive their stories and experiences easily. There are two ways for a brand new job coach to find the information he/she needs: keyword search or tags. In the past, information and knowledge was passed from seniors to juniors but not the other way around. For now, they can be contributed and shared by every job coach.

IV. EFFECTIVENESS ASSESSING

Traffic Analysis

We evaluated the effectiveness of knowledge sharing discussion board according to a traffic-centric metric shown in Table 1. The number of users was 30 where 14 of them participated in the discussions in the observed periods from Apr. 2007 to Mar. 2008. It was observed that 12 members initiated at least one topics. The number of unique subjects was 111 which contained 258 messages, some of them being replies to particular subjects. Therefore, the average number of messages per subject was 2.3 with standard deviation (SD) equal to 2.41. 48 out of 111 topics received replies, which was 43.2%. It was found that the average number of members involved in an initiated subject was 1.7 with SD= 1.3. Traffic patterns vs. months are plotted in Figure 1, where active days stand for the days with members making contributive content.

Table 1: Metrics of Discussion Board

index	value/mean	SD
Members	14	
Members who initiate topics	12	
Topics	111	
Topics with replies	48	
Posted messages (Topics+replies)	258	
Messages per topic	2.3	2.4
Members in a topic	1.7	1.3
Time span of discussions per topic	65 hr	46.4 hr
Messages posted by a member	18	17
Messages per day	2.3	2.7

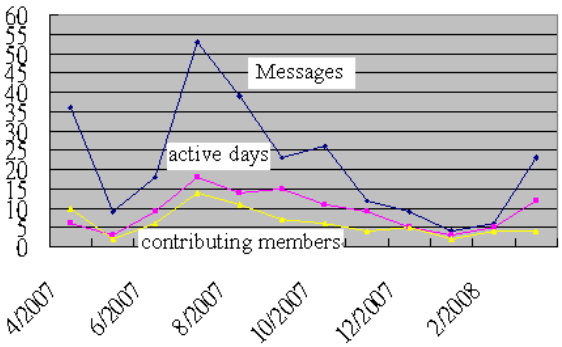

Figure 1: Traffic patterns by month

Network Analysis

Network analysis [17-19] based on the comments between members is shown in Figure 2. Comments are a form of interactions online communities can exhibit. Network analysis with respect to comments 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 comments a member writes to and receives from others. In figure 2, the maximum sum is 51 while the smallest is 1. Five diameters are therefore used to stand for five classes of members whose sums of outgoing and incoming comments range from (1) 0~10 (2) 11~20 (3) 21~30 (4) 31~40, and (5) 41 and above. It is noted that Member 1 and Member 10 both have 9 members who write comments to them, indicating the highest centrality in the network.

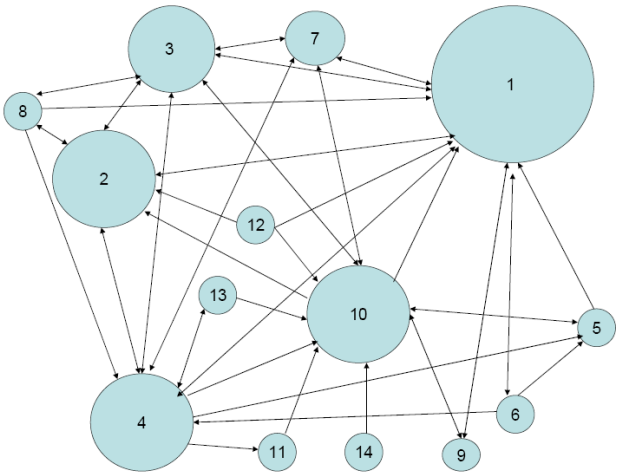

Figure 2: Network of members with directed links representing comments between two members and circles whose diameters indicate the sum of comments a member writes to and receives from others

Further analysis is made by removing members from the network if their sums of comments are no larger than 20, i.e. less than 2 per month in average. The result is shown in Figure 3 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

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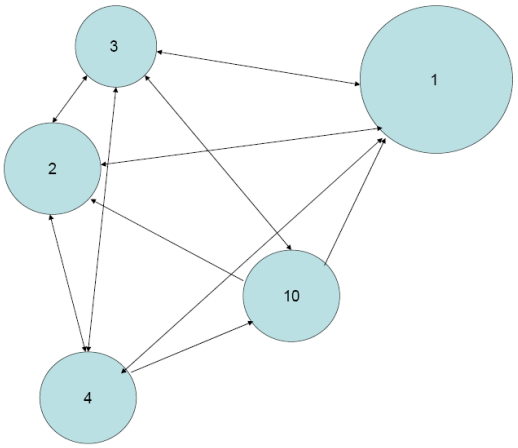

Figure 3: Network of members whose sums of comments are larger than 20.

Performance by Categories

The messages on the forum can be categorized into5 types: (1) general information sharing, (2) job opportunities, (3) emotional support, (4) learning of IT technology, and (5) administration. Statistics of the five categories are summarized in Table 2, 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 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 skills in their trainings, 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 forum has been perceived as a reciprocal channel of showing concerns, support and care among the members.

We find the category of job opportunities exhibits the lowest rate of replies, a fact that is a little disappointing. To find out the

reason, we conducted a series of interviews with the social workers, namely, the job coaches. In the beginning, they were excited when they received new job opportunities in the forum. The response time of messages in this category confirmed the enthusiasm at the early stages when the forum was launched shortly. It turned out gradually that the job news from Council of Labor Affairs rarely conveyed job openings that prioritized persons with mental disabilities. Furthermore, most of the leads did not result in successful job interviews for their trainees with mental disabilities. 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 phones in private.

Content Analysis

Capturing the general picture of the forum through performance measures in the above, we conducted a further investigation of three attributes of messages mediated through social software (as suggested in the work of Hall and Davison [3]). The three attributes are reflection, propositional stances, and affective tomes. All the replies will be evaluated on the three dimensions and coded accordingly. For example, a disagreeing reply with reflective thoughts and positive tones will be coded as RDP, which stands for "Reflective, Disagree, and Positive" in terms of reflection, stances, and tones. The coding results were recorded in Table 3.

Table 2: Performance statistics by category

Category	items	replies	Items with replies	Items with replies(%)	Response time (min.)	Lifespan (min.)
General information sharing	15	8	4	36%	2866	4231
Job opportunities	21	9	3	14%	22	3422
Emotional support	20	24	12	60%	2712	5620
Learning of IT skills	22	36	10	42%	3994	7430
Administration	33	63	17	51%	637	7907

We found that the 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. Therefore, the supportive culture does not only land on the "Emotional support" category but also every other category. 10 of the 12 replies with disagreement or mixed responses actually came from the category of learning of IT skills. 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: Content analysis and statistics

Reflection			**Propositional stance**			**Affective tone**		
Reflective	34	23%	Agree	135	92%	Positive	138	94%
Un-reflective	104	71%	Mixed	11	7%	Even	9	6%
Context-free	9	6%	Disagree	1	1%	Negative	0	0%
Total	147	100%		147	100%		147	100%

Reflective replies are less than one fourth. Composing reflective messages takes more time and effort than those that are not reflective. According to the interviews, the social workers unanimously experienced busy work styles 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 and actions.

V. DISCUSSIONS

One of the major factors affecting people's attitudes toward a new technology is the attributes of the technology itself. Rogers [15] identified five main attributes of technology that affect its acceptance and subsequent adoption: relative advantage, compatibility, complexity, observability, and trialibility. Thus, a new technology will be increasingly diffused if potential adopters perceive that the innovation: (1) has an advantage over previous innovations, (2) is compatible with existing practices, (3) is not complex to understand and use, (4) shows observable results, and (5) can be experimented with on a limited basis before adoption.

Compared to existing networked innovations, online forum technology has the advantage of being more affordable and less maintenance demanding from NGO's point of view. The forum system is a result of thorough action research and draws upon the need of routine tasks of job coaches; therefore, it is compatible

with existing practices. We also find the entry barrier to using forums is comparatively lower than the ISs used by most NGOs. Job coaches are able to pick up the skills and internalize them without significant difficulty. Observable results include more frequent message sharing, shorter periods of information dissemination, and closer connectedness of the social work staff. The forum can be put to test without difficulty and limited pilot trials can be experimented before large scale systems are actually built and adopted. In Table 4, we list the benefits of introducing forums to the participating NGO.

Table 4: Benefits of introducing online forums in Taipei Employment Services for iIndividuals with mental impairments.

Category	Tasks	Before	After
Front line helping tasks	Dissemination of employment opportunities	Batch notice issued bi-weekly	• Immediate sharing on online forums • Automatic aggregate of job bulletins mailed to job coaches daily
	Pre-occupational training	Training materials on paper	Multimedia & interactive courseware

VI. CONCLUSIONS

Traditional site traffic analysis based on site visits, page views, number of posts, and length of stay provides only limited insights to human behaviors 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 help implicit organizational culture surface and emerge. The integrated assessment gives a perspective of the organizational behavior in the social service group we studied.

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