What Are You Working On?
Status Message Q&A in an Enterprise SNS

Jennifer Thom[1], Sandra Yuen Helsley[2], Tara L. Matthews[2]
Elizabeth M. Daly[1], David R. Millen[1]

IBM Research - Cambridge[1], Cambridge, MA USA 02140
IBM Research - Almaden[2], San Jose, CA USA 095120
{jthomsa, syuen, tlmatth, dalyeliz, david_r_millen@us.ibm.com}

Abstract. Social networking services (SNS) have been deployed within enterprises to encourage informal social interactions and information sharing. As such, users have turned to the status message functionality in a SNS for social information seeking by employing it as a medium for question asking. In this paper, we present the results of a qualitative study observing emergent question and answer (Q&A) behaviors in an enterprise SNS and then describe user motivations in employing this medium for social information seeking. We report data describing the types and topics of questions asked within the workplace and the prevalence of questions and responses within this system. Results suggest that users choose status message Q&A for non-urgent information seeking needs and perceive question asking as a way to elicit social support from their professional networks.

Introduction

Business workers encounter a variety of information seeking needs each day. For instance, one might have to find the appropriate market research to help determine the best strategy to win a major account. Another scenario might involve looking for the right person to move across the world to fill a newly

created leadership position. Everyday concerns can also arise, such as finding the right lunch spot or how to properly file travel expenses.

Professional networks, whether through face-to-face peer support or online forums, have long played a critical role in helping employees get answers to questions (Nardi et al., 2002; Preece, 2000; Wenger, 1998). With an increasingly distributed and matrixed workforce, companies are increasingly turning to social networking services (SNS) to continue enabling questioning and answering (Q&A) via these peer support networks (Matthews et. al., 2011). The advent of social software in the workplace provides business users with new ways of interacting with their professional social networks for question-asking (DiMicco, Geyer, Millen, Dugan, & Brownholtz, 2009).

In this changing landscape, it is important to understand whether and what aspects of employee Q&A behavior are supported via SNS, so companies can make informed decisions about which to deploy and designers can understand what design decisions lead to specific workplace usage practices. Prior studies have shown that SNS users outside the enterprise have appropriated microblogging and status message functionality to broadcast questions to their networks (Morris, Teevan, & Panovich, 2010). Benefits of such an approach include additional personal context possessed by one's social ties and the ability to ask a natural language question with the possibility of various responses, particularly when a question is subjective in nature.

Questions directed towards one's professional social network in an internal enterprise system, however, may serve a different purpose than those asked to one's personal network. First, a worker's job role likely affects the information seeking needs, resulting in different topics of inquiry. In addition, managing one's workplace reputation may influence what types of questions are asked to one's professional social network, since such interactions to anyone in the company who visits the SNS. Finally, within a large enterprise, a multitude of tools already exists for social information seeking, such as user-generated knowledge repositories, online communities, and expertise location systems (Ackerman & Malone, 1990; Millen et al., 2007). However, initial evidence suggests that employees do turn to an organizational microblogging tools for social information seeking (Zhang et al., 2010; Zhao, 2011) and to ask work-related questions (Ehrlich & Shami, 2010).

In this paper, we answer the following research questions through a qualitative study of question-askers and questions-asked in the context of status messages in an enterprise SNS.

RQ1: *What types of questions and question topics are being asked within an organizational SNS?*

RQ2: *What motivates users to appropriate status message functionality for question asking within an enterprise?*

We observe that users within an enterprise turn to status message Q&A for both information seeking and social support for a wide range of non-urgent, primarily work-related topics. We discuss the importance of Q&A via a SNS as a means for employees to garner peer support, as evidenced by the prevalence of rhetorical or discussion-oriented questions, including a significant number on social topics. Finally, we describe user motivations for choosing other tools for question and answers, namely a desire for structured interactions and searchable content.

RELATED WORK

Organizational Q&A

We characterize question asking within the workplace as an instance of social information seeking, which can include the activities of social search and expertise finding. Beyond meeting information seeking needs, social information seeking in the workplace provides social support, increased rapport, and visibility to one's coworkers (Morrison, 2002). Question asking, as a social information seeking strategy, can help to reduce uncertainty regarding job-related tasks and processes. These questions can be overt in nature, when a question-asker feels comfortable with asking someone in a direct manner (Miller & Jablin, 1991). Non-interrogative questions (e.g. one employed primarily to establish rapport) can be used when the question-asker is uncomfortable in seeking information or hopes to avoid seeming unknowledgeable (Miller & Jablin, 1991). This suggests that question-askers make judgments regarding the content of questions, depending on the potential answerer.

Question asking can be costly and time consuming for the seeker and requester. As a result, technologically mediated solutions to reduce the burden have emerged within workplaces. One example, Answer Garden 2, provides a collaborative help system through a series of question dialogues routed to local employees and intelligently escalates requests for help to organization-level experts (Ackerman & McDonald, 1996). In addition, the social information seeking process can be supported by tools that support people-finding within the enterprise (Farrell et al., 2007) and expertise location systems (Ackerman et al., 2002). Microblogging has been used by workplace project teams for social information seeking among other uses, such as sharing information and status udpates (Zhao et al., 2011). These systems may be especially useful within an enterprise, as perceived safety within a corporate intranet may influence employees' perceptions of information quality provided by fellow co-workers (DiMicco et al., 2008). Additionally, because reputation as an expert can be

beneficial to one's career, certain employees may actively seek out attention as an answerer to bolster's one standing as an expert, and contribute valuable and relevant information (Thom-Santelli et al., 2008).

We propose that organizational SNS may also be particularly well-suited to supporting social information seeking, as an employee may feel comfortable asking work-related questions of their professional network. In addition, if these requests for help emerge in the forms of questions, identifying and classifying these behaviors in an organizational SNS can help designers better support social search and help-seeking within the enterprise.

Online Q&A Outside the Workplace

Online requests for information are not a new phenomenon, with Internet users turning to e-mail (Camino et al., 1998), and online forums such as Usenet (Welser et al., 2007), for answers. More recently, Q&A sites, such as Yahoo! Answers, Mahalo Answers or Quora, offer explicit support for such activity. Research has investigated the topical content of questions on these sites, ranging from technology-related questions to entertainment-related ones (Adamic et al., 2008; Nam et al., 2009).

However, these sites do not specifically leverage one's social network. Recently, Facebook has also introduced a separate question and answer feature on their site where users can pose questions and Facebook users, regardless of network connection, can provide an answer. For questions that require context or when seeking the advice or opinions of one's connections, users have appropriated microblogging to ask questions of their social network. Categorization of Twitter messages revealed that a proportion of tweets contained a question, suggesting that users appropriate these systems to find information (Ehrlich & Shami, 2010; Naaman et al., 2010). Morris et. al. (2010) provide an initial categorization of the types and topics of questions posted on Facebook profiles and observe that these particular questions may be more subjective and opinion-based in nature.

The context of one's personal social network can be different from one's professional network, which may lead to different types of question asked. For instance, one may feel comfortable asking one's Facebook network about dating relationships, but this is less likely to happen in one's work network. In this paper, we extend Morris et. al. (2010) to describe how the different information seeking needs inherent in an enterprise affect the types and topics of questions asked of one's professional network as opposed to one's personal network.

The ecology of workplace tools

The particular organization under study is a global enterprise that encourages social software use by their employees. As a result, there is a diverse ecology of

tools available for use that leverage employee expertise and user-generated content for information seeking and collaboration. Despite the availability of a wide selection of systems, prior research suggests that users' choice of collaboration tool is influenced by characteristics of their work task and the tool's design (Balakrishnan, Matthews, & Moran, 2010). We suggest that employees meet social information seeking needs within the enterprise by making similar judgments about the search task and the affordances of available tools.

For example, employees have used a social bookmarking system as an exploratory information-seeking tool to browse and re-find online personal and community resources (Millen et al., 2007). Along with traditional e-mail and instant messaging tools, other systems supporting social information search include shared repositories of automated web search processes (Leshed et al., 2008) and expertise location (Shami et al., 2009). However, the type of information seeking supported by each of these systems has its limits (e.g. only web pages, processes or people returned respectively). Q&A has also been supported by a number of systems within this particular enterprise, such as through peer-support interfaces to initiate chat with targeted communities (Ribak, Jacovi, & Soroka, 2002). There are also online forums for technical help and online communities for users of similar interests, which offer threaded, asynchronous conversations. However, the forums and communities do not leverage a user's articulated social network but instead solely the members of that particular online environment.

SNS and status messages have a number of design characteristics that may influence how questions are asked. Status message functionality possess character limits to encourage brevity and cross-platform posting and possess a post form that encourages natural language statements. The asynchronous responses to questions are public and visible to those who have access to a profile. Taken together, these factors can shape how social information seeking occurs through status message Q&A in the enterprise.

Method

Since 2009, LOTUS CONNECTIONS has been the primary SNS of a large global technology firm with approximately 400,000 employees. LOTUS CONNECTIONS offers a variety of social software features, such as blogging and wiki tools, but of particular interest is the personal profile. The profile page in LOTUS CONNECTIONS contains a personal photo, contact information, job title and manager/report to information, populated automatically from the corporate directory. The profile displays an articulated social network in the form of reciprocal friend connections (e.g. invitations to connect must be accepted.)

There is a microblogging/status message feature within the profile with a prompt on the post form that states, "What are you working on right now?" Users

can view status messages in a number of ways. First, there is a homepage, which aggregates the recent messages of your connections, much like the Facebook NewsFeed. Second, the profile page displays one's own status messages and comments by other members of LOTUS CONNECTIONS on a Board, similar to Facebook's Wall feature. Status messages can be entered on one's profile page, on the homepage, or using various browser plug-ins and applications. Comments can be added on anyone's Board; that is, members can leave a comment regardless of whether he or she has an articulated friend connection. There is a 500-character limit on status messages in LOTUS CONNECTIONS, compared to Twitter's 140 characters and Facebook's 423-character limit.

The following analysis is based on a crawl of LOTUS CONNECTIONS, containing profile activity from April 2009 to September 2010, with 22647 distinct users contributing one or more status messages. We collected 309,925 status messages that formed 191,752 distinct threads. To determine what messages were questions, we looked for status messages with question marks at the ends of complete sentences and eliminated those messages with extraneous questions marks (e.g. embedded inside URLs), with 10.96% (17,508) of the threads originating with a question. Note that this has likely missed some questions where posters excluded the question mark.

In addition to understanding the types and topics of questions asked through the system, we wanted to understand why people asked questions of their professional social network and what value they derived from the exchanges. Hence, we conducted 14 (12 M, 2 F)[1] semi-structured 60-minute interviews with question-askers from a selection of organizational units and work locations. Because it was important that participants have experience asking a variety of questions and receiving a variety of responses in order to reflect on question and answering behavior and value, we recruited from the most active question-askers.

From this log analysis, we determined an initial interview sample of the most active question-askers, and then narrowed down the potential participants by those who had last asked a question in the month prior to the interviews. Table 1 describes our participants' demographic characteristics in detail. Participants described their general social software usage activity both inside and outside the organization, including microblogging and SNS sites and whether or not they engaged in question asking in those systems. We selected three recent questions from each participant's board as probes to elicit descriptions of their motivations for question asking and to gauge their reactions to the answers they may or may not have received.

---

[1] The gender distribution is consistent with past user studies of systems deployed within the enterprise.

	Job Role	Years at company	# of connections
J	Consultant	8	244
L	Social Software Expert	13	1618
A	Software Marketing	9	213
JB	Software Strategy	10	391
H	Online Learning	27	213
R	Software Strategy	14	211
K	Software Marketing	14	244
M	Hardware Planner	10	251
Y	Social Software Expert	2.5	319
RB	Software Engineer	13	133
S	Social Software Expert	3	260
P	Support Engineer	11	271
D	IT Specialist	20	58
G	Sales Engineer	14	260

Table 1. Interview Participants

Finally, we sampled the 306 most recently posted English-language questions and coded them according to categories drawn from prior research and from open-coding. Each question was coded for type and topic, with four researchers developing the codes and settling disagreement through discussion (kappa for type = 0.88, $p < 0.01$, kappa for topic = 0.80, $p < 0.01$). We chose recent questions to control for system novelty effects and to observe these behaviors in a stable production system. The interview participants also contributed 25% of the questions coded.

Results

Question types and topics

Overall, the questions (n=17,508) in the dataset were a mean length of 25.83 words (SD=22.41) with a median response time of 55.37 minutes (a minimum of 0.41 minutes and a maximum of 11,275 minutes). Threads beginning with a question (n=17,508) received a mean of 2.4 (SD=3.35) responses while threads beginning with a non-question (n=174,244) received a mean of 1.54 (SD=1.97) responses. 18.7% of threads beginning with a non-question (n=141,611) received a response, while 42.1% of question threads (n=17,508) received a response.

Table 2 describes the coding scheme we applied to the 306 most recent questions, exemplars of each category, and the frequency distribution of the question types. We defined information seeking questions, drawing from Morrison's (2002) model, where questions were in search of factual knowledge to reduce uncertainty. Rhetorical questions were consistent with Morris et al. (2010) and Harper et al.'s (2009) definition of conversational questions, with the question's intent to elicit discussion or social support. Solution-type questions consisted of "how do I"-type inquiries in search of specific answer to a problem (Cross et al., 2001).

People-seeking questions can be likened to expertise-location, where users are in search of a specific person who may be able to provide help or further information (Cross et al., 2001). Opinion-gathering questions, drawn from Morris et. al. (2010), deal with requests for subjective information that provides judgment on a topic. Favor questions were defined as requests for services while offers gauge interest in available items or services (Morris et al., 2010). Coordination questions are those that are meant to organize a desired action (e.g. scheduling a room reservation). Invitation questions advertise or request attendance at an event (Morris et al., 2010).

Type	Example	Frequency
Information Seeking	Is there a Windows 7 image I can use on my dual-boot system? I d prefer something that didn't require me to wipe the MBR and current XP partition (i.e an upgrade path).	121 (39.54%)
Rhetorical	Wow, I just *personally* qualified for 150 million dollars in stimulus funds! (spam filters have a tough job, don't they?)	82 (26.79%)
Solution	new laptop - Windows 7 - how to get Notes 8.5.2?	32 (10.45%)
Invitation	Did you miss the Practitioner Portal demo last week on the Blue IQ session? The replay has been posted here: http://xyz.com/1BTP - Check it out!	20 (9,71%)
People-seeking	Recruiting an engagement manager to help deploy InfoSphere at major accounts in the MidAtlantic...do you have any candidates to refer?	15 (4.90%)
Favor	Hi Matthew - I am sure you can save me some time :-) I am searching for the plugin/feature that syncronizes Sametime status with this in Lotus Connections - I think I have seen a discussion about it on your Board some time ago. Can you please post a link to the project/download page?	16 (5.23%)
Opinion Gathering	So what s your opinion on posting duplicate blog entries on different blogs? I see it as reaching different folks via different channels. Just like posting the same information on Twitter, Facebook, and LinkedIn (even Connections - myDeveloperworks or xyz.com/communities). What say you?	14 (4.58%)

Table 2. Question types.

Table 3 describes the topics of the questions observed in the sample. Internal products referenced systems and technologies that are deployed or sold by the technology company under study, while the technology category referred to external systems or competitive products. Internal knowledge described processes employees may need to do for their job (e.g. filing expenses, booking travel). Conceptual questions included abstract or philosophical questions meant to guide one's behavior, similar to Morris et al.'s (2010) category of ethics & philosophy. The social category described questions that were related to social support or interaction (e.g. jokes or congratulations). People/connections described questions with topics dealing with finding a specific person or connection. General professional topics dealt with questions that were related to broad issues relating to career development.

Topic	Example	Frequency
Internal Products	What is the best "Intro to [our product]" file that you have seen or used? Looking for suggestions, so point me to the [our product] Files based file that you feel is best! Thanks :-)	94 (30.72%)
Technology	Anyone tried greasemonkey enabling dojo? dojo.require not working	60 (19.61%)
Internal Knowledge	Hi C - is there any list that says what [our company]'s discount program includes at Staples?	47 (15.36%)
Status	Back in Ottawa, trying to figure out the next few weeks. CIDA, Talisman?, Mobility Strategy gigs? Marketing events on Collab and virtual workspace, kick-off on United Way.	31 (10.13%)
Social	TL M, how are you? take care	28 (9.15%)
Personal	trying to read through mountain of mail. Busy day made busier by a pediatrician appointment AND a mortgage refinance closing today. It never rains, right?	15 (4.90%)
People/connection	Recruiting an engagement manager to help deploy InfoSphere at major accounts in the MidAtlantic...do you have any candidates to refer?	12 (5.83%)
Conceptual	now that it is "legal", would you / have you jailbreak your iPhone ?	11 (3.59%)
General Professional	are you attending or chairing? could i have a short session with you the next time we are in the same location? I am still at mediocre level and would like to (in *company* language) raise the bar :)	4 (0.03%)

Table 3. Question topics.

As shown by Table 2, the most popular type of question-asked in the sample was information seeking, followed by rhetorical and solution. Question topics, as befitting a global IT enterprise, focused on internal products technology, internal processes, and status, but also interestingly included 'social' in the top five topics (Table 3). Aside from the social questions, these results are consistent with prior research on enterprise microblogging: questions are focused on work-related topics, regardless of whether they are information-seeking or rhetorical in nature (Ehrlich & Shami, 2010). The prevalence of social questions in an enterprise SNS is unique to our results.

Table 4 reports the frequency of question type by topic, for the most popular question types. Of the questions regarding social topics, the two predominant question types were information-seeking and rhetorical. Information-seeking questions regarding social topics are consistent with the notion of people sensemaking, where SNSs support impression formation and informal communication of one's fellow co-workers (DiMicco et al., 2009). Rhetorical-type questions regarding social topics and internal products tended to evoke commiseration about general workplace frustration with the workplace in an informal, non-confrontational way, similar to the playful expressions of dissent observed in other types of media sharing in an enterprise SNS (Thom-Santelli & Millen, 2009).

Motivations for asking questions at work

From our analysis of the most recent questions and the interview data, we observed three themes that describe the motivations of employees to turn to microblogging Q&A in the workplace. First, urgency plays a role in the decision to turn to one's social network. Second, status message Q&A encourages easy posting and broadcast but retrieving the answers for later use proves difficult for users. Third, the questions asked within status messages, consistent with the relative popularity of the rhetorical questions, are also posed because of the broadcast nature of microblogging.

Urgency and timeliness

Participants noted that they tended to turn to microblogging Q&A in LOTUS CONNECTIONS when the question in mind was not urgent or critical to one's work.

Type	Topic		
	Internal Products	Technology	Social
Information-seeking	41	25	17
Rhetorical	16	9	10
Solution	14	16	0

Table 4. Frequency of question type by topic.

From our analysis of response times, we observed a median time of 44.21 minutes to first response for information seeking-type questions and a median response time of 66.75 minutes for solution-type questions. This suggests that users' perceptions of a non-immediate response time are not necessarily unfounded. Eight of the participants expressed this motivation in their interviews.

> What I'm asking about is not really really urgent. It's not urgent enough to say that I really really have to know right now. I either am just curious or just something that I am comfortable with lagging for at least 15 minutes.....It wasn't that big of a deal. (H, online learning)

Below, we show an example of a non-urgent information-seeking question about an internal process cited by a participant during his interview. In this case, the participant's question related to an upcoming trip to another location within the organization and the possibility of finding drop-in workspace there.

> **Q: Are there any drop-in desk in Meguro office? I've never been there.... Sep 30**
>
> (Y, social software expert)
>
> **A1: Respondent A Sep 30**
>
> I'm afraid I don't think there are. But it's directly connect to the Meguro
>
> Sta. so that really convient (sic) and looks very modern which looks unlikely a
>
> Company office....
>
> **A2: Respondent B Sep 30**
>
> have used a meeting room there when I couldn't find the place to work.
>
> So, it might be possible if you can find the meeting room and work there.
>
> **A3: Respondent C Sep 30**
>
> I now work near Meguro office, so I knew there isn't. Meeting rooms are
>
> for Company-ers who registered for the office only. And recently, they even
>
> change the reservation system with ACL check so that you can't even check
>
> whether the rooms are available or not. I'd say there are not friendly for
>
> visitor use.

The participant did receive satisfactory answers to his question, but this matter was one in which he possessed adequate lead time in planning his tasks. As a result, this particular information seeking need did not require immediate turnaround and the response time satisfied the participant.

One possible reason for participants to reserve the microblogging channel for less urgent questions is a low expectation for a response from others. Participants attributed this sense to a variety of factors such as the nature of the SNS, an overload of items in social awareness streams, or the size of their social network.

> No, I did consider posting it elsewhere; I was looking at a short timeline, but not so short that I needed a response right away. If it was really customer urgent, I would take the trouble of posting it in multiple places. In Lotus Connections it's ok if nobody answers. (S, social software expert)

At the same time, all participants noted that they accessed LOTUS CONNECTIONS in between tasks, time permitting, contributing to fragmented usage patterns. Such interstitial activity, if common among users, likely contributes to the response rate and time to response.

In addition, the likelihood of response in a global enterprise also depends on the time of day of posting and the availability of online readers. We observed one instance where an interview participant re-posted his question in a status message at two points in time to gather responses from both Europe and the United States.

> There's a specific reason [for posting the question again]. The specific reason was reaching out to different audiences based on geography. [...]
>
> I think the first time I posted, it was actually posted more for a European audience, and since that didn't get much of a European response, that's why I went and posted it a second time to reach out to the US audience. That's one of the things about having a global network, like we all do at Company, is that we're working on projects [...], sometimes we need to be conscious that the people we need to reach out to, we need to fine tune to get them at their best time zone.
>
> So typically if I'm looking for a European audience, I wouldn't post a question, for instance, right as we speak, because right now it's 7pm on a Friday afternoon (in Spain). I would go and rely on my US audience. But something like Monday morning, 9am my time, would be the best time to post that question for a European audience. (L, social software expert)

This participant, as an EU resident, has had to adjust his posting style in order to maximize the chances of eliciting responses from a globally distributed network. However, for the participants with more geographically homogenous networks, such adjustments were not as common.

Participants also reported choosing other channels for social information seeking when the matter at hand is urgent. In these situations, the channel chosen is usually synchronous in nature, such as finding colleagues face-to-face if working in a traditional office setting. When working remotely, participants turned to instant messaging to meet immediate needs, but this choice is likely to be more successful if a potential answer can be found within one's immediate contact list.

Structure and Future Search

Prior research studying the usage of available systems in the collaboration environment within this enterprise suggests that employees assess the characteristics of their tasks to make an appropriate choice from the ecology of tools (Balakrishnan et al., 2010). As the previous theme suggests, the time sensitivity of the information seeking need is one factor that influences whether or not users will turn to microblogging for Q&A. In this section, we observe two socio-technical characteristics of systems employed for Q&A that are salient in the decision-making process – whether the community supports general or specific requests and the manner in which a system archives Q&A interactions.

Seven of the interview participants reported they turned to question asking within status messages for less-technical work-related questions intended for a general audience with a wide range of expertise. The rationale for this choice related to a sense that reaching out to one's social network would likely garner a helpful answer, particularly if this were a question where a number of possible answers. Related to the likelihood of finding an answer through one's social

network, five of the interview participants noted that they felt their social networks were large and varied enough to provide enough of a chance to receive a response.

Below is a question from one of the interview participants regarding references and examples that she needs for an upcoming presentation.

Q: Any references / case studies for [our company] regarding social networks and retail? **(S, social software expert)** Oct 25 6:09 AM

A: **Respondent A** Oct 25 6:13 AM

I believe [company M] is our reference. Do a search in connections for "LOTUS CONNECTIONS customer references" . LMK if you can't find it.

A: **Respondent B** Oct 25 6:14 AM

Hi S., not sure whether there would be plenty of them, but under my Bookmarks I have got a bunch of reference links on case studies under the tag "case-studies" and / or "business-value"; you may want to have a quick look through and scan through some of them... Hope that helps...

A**: S (question-asker)** Oct 25 7:24 AM

Working on deck about social networking and retail: (html link provided) - looking into beefing up "Next steps" section.

A**: Respondent C** Oct 25 8:47 AM

Take a look at Company B from Company C They are an [Our Company] Global Entrepreneur. So far they have not adopted any [of our company's] platforms - however, their intention is to do so. If you wish, I can put you in touch with their CEO.

A**: Respondent D** Oct. 25 8:47 AM

CompanyM is not a reference for [our company]. it is only a reference for Commerce.

In this case, the participant received answers from a diverse set of respondents from different sub-organizations within the Company, and none with whom she works with directly. This example also illustrates the conversational nature of the information seeking questions that received more than one response. The conversational turns, however, are brief, and participants reported that long posts and long threads on a Profile Board could be hard to follow and track, as noted by this participant.

For information seeking needs that are detailed or technically complex, participants reported choosing more structured systems for Q&A. Five of the participants turned to online forums in a traditional online bulletin board set-up, with topic-specific areas, for such questions. For these participants, complex technical questions that are central to one's day-to-day work tasks were more appropriate for the forum, particularly as they were designed to aggregate people with common expertise and interests and providing topic-based support, as noticed by the following participant.

Forums are where I go when I'm stuck and need an answer before I can proceed on a problem. If I really need help and I need the attention of multiple people who know about that area, I'll go to that forum. It's like a directed questions (area) and it's things where it's pretty urgent for me to get some help here. (D, IT engineer)

In addition, there are subject-matter experts whose job roles include forum participation to specifically address any technical concerns and questions. Four of the participants used Answers, a traditional Q&A site, because they felt that the responses they received there were longer and more detailed. We observed that three of the participants cross-posted between status message Q&A, forums and Answers by either posting a link in a status message to the other site to re-direct responses to those channels so that they could these sites for future reference. The four participants noted that the cross-posting was an attempt to elicit responses from their general social network in another system and inform readers of a potential answer elsewhere.

Participants noted that both Answers and the forums were better suited for search and refindability of content. The current design of the Lotus Connections board is a social awareness stream displayed in chronological order, from most recent updates at the top of the page, with older messages collapsed and hidden from view. Forum and Answers content is searchable, with both systems surfacing older content in search results according to relevance.

> There's a little bit of a different focus in there as to why I would use one or the other, and it's also a little bit of a focus from the perspective of how permanent I want that answer to be. If I want to have an answer to a question that stays there forever, and can be retrieved easily, probably I won't go to Connections Profiles, since right now there's no easy way to find older information. [For something 6-12 months later] I would probably go to a blog or more to a discussion forum, or whatever else. (A, software marketing)

There is the danger, as observed by two participants, that archived technical content in the Forums, in particular, can be outdated so questions must be repeated, which introduces additional noise into the search results. However, overall participants expressed greater satisfaction with the ways that structured question tools archive information.

Commiseration and Requests for Social Support

The relatively unstructured nature of the status messages, however, encourages discussion and conversation, which is consistent with the higher number of rhetorical-type and social-topic questions we observed in our coding. Four of our participants indicated that they posed questions to specifically encourage debate about open-ended issues.

> I post for several reasons. One is to provoke discussion. So, sometimes I ask questions to do that. Or I'll make a statement and ask for feedback. Sometimes, I'll take a weird position to get people to think about it. Othertimes, I'm working on a problem. So, I'll take a position on a problem and see if I can get some interaction. Usually, it's something fairly work-related. And sometimes, it's where I'm trying to be the conscience for people who are all going into one direction. And I think that might not be as healthy as people think about things more carefully. And debating. (B, software strategy)

However, these four participants, in particular, have garnered professional reputations as thought-leaders within the organization, such that responses are likely more forthcoming than others who are less visible.

Even when responses are unlikely, ten participants reported that rhetorical questions served as a way to air frustrations encountered in everyday tasks at the workplace, such as in the question below.

> Q: I'm starting to wonder if all these reply to all is a way for people to have fun? I don't necessarily mind the emails, I can delete them. What I mind is that every time a message comes in, it kicks my Pavlovian instincts to unholster my blackberry. Getting a good workout.. :) (G, sales engineer) Sep 23
>
> *A: Respondent A. Sep 23*
>
> I am on the same list and its scary that these folks do not understand a simple concept - hit the delete key!!!!
>
> **A: Respondent B Sep 23**
>
> I had to turn that incoming message alert off on my blackberry. I couldn't fight the urge to check everytime a message came in.
>
> **A. Respondent C Sep 23**
>
> LOL

The participant notes his motivation for asking such a question below.

> Maybe it was a rough day. I may have gotten conservatively 150 emails in the span of a day and a half. Um, with all of these reply to all, stop replying to all comments. It's kind of funny. I used to see this a lot. Maybe 5-6 years ago. And, it hasn't happened in the last 5 or 6 years, This is the first time in 5-6 years that this thing is still going. So I was thinking, is this thing for real? Are people actually doing this? (Laughs) It kind of surprised me. It was more a surprise than anything. I suppose..it was also a post to gauge who else was getting these emails and who else was on the distribution list, you know, indirectly.

We observed that participants intended these types of questions to elicit commiseration from their social network, consistent with prior research that suggests that comments on social media content can help users discuss sensitive workplace topics (Thom-Santelli & Millen, 2009). However, whether or not these questions are effective in gathering responses is uncertain. Rhetorical questions had a median time to first response of 85.23 minutes as compared to information seeking questions (44.21 minutes), with both receiving a median of 2 responses. Posters of these types of questions also had a low expectation of response, as we observed with respect to information-seeking questions. However, our data suggests that simply broadcasting the information was the main intent, as opposed to receiving a direct response.

Besides seeking social support through rhetorical questions, seven of the participants reported using question-asking as a way to request assistance or attendance, such as in the quote below.

> No, I didn't get any responses but essentially it wasn't much of a question, it was more of a reminder and an announcement, [...] basically what I wanted to do was to broadcast the message out that if people wanted to submit an abstract for the conference [they could still do it]. I wasn't expecting an answer on that one, more than anything else, because I knew if people

would answer, they would tell me, "Yes I'm interested," "No, I'm not interested" [...] [but it wouldn't necessarily fulfill the answer itself,] it was more meant from a broadcasting perspective more than getting an answer to it. And I didn't get any other responses through IM or email or whatever else. I wasn't expecting them. (L, social software expert)

In the categorization of question-types, however, we did observe relatively fewer examples of favor questions and invitation questions, and it is possible that users may modulate these behaviors to reduce the appearance of freeloading on their social network. Participants noted that wording requests or announcements as questions was a conversational strategy to make such statements more engaging or encouraging, as in the quote below informing others of a job post.

It wasn't information seeking, but posting it as a question makes it more conversational. I wasn't expecting responses, they might be just to go to the job post.] It was a fake question. [It was to make the job posting more engaging. I could have said something more direct, which was fine, but it was more interesting this way. (S, social software expert)

This suggests that users are aware that burdening their network with impolite requests or too many invitations may affect their audience's impression of their activity on the SNS.

Discussion and Implications

This is the first study focused on social Q&A behavior in the workplace. Comparing to social Q&A behavior outside the workplace (Morris et al. 2010), we see that the types and topics of questions asked are quite different. Topics asked to a general social network included entertainment, home and family, shopping and so on (Morris et al., 2010). Topics such as these were completely missing from workplace social Q&A, which instead focused on the company's products, technology, company-internal knowledge, and work status. While this difference is not surprising, we were intrigued to find that social and personal topics made up a substantial 14% of question topics, showing that a social Q&A system in the workplace will not be exclusively work-related. This departs from prior research on enterprise microblogging behaviors, which has characterized it as primarily work-related (Ehrlich & Shami, 2010; Zhao et al. 2011). Our data suggests that professional networks provide workers with peer support of a personal and social nature. The top question types found in a general social network were recommendations and opinions (Morris et al., 2010), compared to information seeking and rhetorical in the workplace. Again, the need for peer support in a work context guides these results.

The desire to connect with peers is indicated by the prevalence of rhetorical questions (27% of questions). Our interview data reveals that our participants used these types of questions as a form of self-expression regarding their opinions of work issues or to elicit commiseration about work matters. Our participants saw rhetorical-type and social-topic question *asking* as increasing their social

capital in a workplace context, whereas prior studies of general social Q&A behavior have focused on question *answering* as a way to build social capital (Morris et al., 2010). The resulting responses to these rhetorical questions, if any, may help to maintain ties by serving as a signal to the asker that the answerer valued the social relationship enough to reply (Donath, 2008). However, we did observe that users were not necessarily expecting a response to rhetorical questions, but using the question format to express an opinion in an interactive manner.

While our data suggests that workplace users find it relatively easy to ask a question for information seeking via microblogging, re-finding the responses received at a later date was more difficult. As a result, participants turned to workplace systems, such as forums or Q&A sites within the intranet, with more structure when they needed answers to complex technical problems, as they found the social awareness stream difficult to follow or that search capabilities were greater for systems that were intended to be archival. However, the potential audience available through one's professional social network on LOTUS CONNECTIONS is still a valuable resource, and we observed a few instances of a workaround where users cross-posted links between the systems to gain the benefits of both. On the other hand, the lack of structure also contributed to the openness necessary for users to post questions to stimulate conversations or gather opinions.

Finally, we observe that workers chose microblogging functionality for Q&A when the need for responses is not time-critical, consistent with earlier analysis of Q&A outside the workplace (Morris et al., 2010). Our analysis of site activity suggests that status messages phrased as questions do elicit responses more often than non-questions; however, there are relatively few responses and they do not arrive immediately. This may be partially influenced by general usage of the site, as participants reported visiting LOTUS CONNECTIONS interstitially and as a break from other tasks during the workday. For non-work SNS usage, Morris et. al. (2010) report that users find the lag acceptable for non-urgent queries that may be difficult to compose in a search engine. In a work context however, our participants report that the longer response cycle leads them to turn to other media for questions when the need for an answer is urgent.

From these results, we suggest the general choice to employ microblogging Q&A within the ecology of workplace tools occurs because of two key design affordances: the ease of posting a question and the potential social and broadcast nature of the medium. The nature of the information seeking need, however, also influences how users make the decision to favor a particular social information seeking system over another. In addition, we observed that users seek social support through their peers by eliciting interactions on a publicly visible networked online space.

A possible explanation for an employee's motivation to turn to an enterprise SNS for Q&A may lie in changes in team structure. Modern companies are moving away from work focused on stable teams to a more matrixed way of working that involves teams where membership is constantly in-flux (Chudoba et al. 2005; Mortensen and Hinds 2002; Nardi et al. 2002; O'Leary et al. 2011). With this change, workers can no longer rely on a stable set of teammates to provide peer support functions, which are critical to individual and group success (Kraut 2003; McGrath 1984). These peer support functions center around Q&A, with workers asking their peers for information, feedback, social support, and so on. The result is that professional networks have become increasingly important at providing these peer support functions for individual workers (Nardi et al., 2002, Matthews et al., 2011). Workers participating in teams with dynamic membership also turn to their professional networks to find people with specific expertise to join their teams (Matthews et al., 2011). Based on this prior research, we propose that employees may be appropriating status message Q&A as one possible source of stable peer support.

Finally, we address the limitations of the current study. The behaviors observed may be influenced by the particular culture of this organization and further comparison work should be conducted, if generalizability across organizations is the goal. An additional limitation is the focus on active lead users, which may not be representative of the total population. Nonetheless, they do shed light on the motivations of our active users whose contributions are central to the health of the system.

Conclusion and Future Work

The contribution of this paper is an in-depth qualitative study of user motivations and a characterization of status message Q&A behaviors within the workplace context. We describe user motivations for status message Q&A within the enterprise and the characteristics of the questions asked in the appropriation of this particular functionality. We also observe how users integrate microblogging Q&A into the ecology of workplace tools available for social information seeking, and will now propose a categorization of information seeking needs that are suited to these kinds of interactions. However, we also note that question asking, depending on type, in this environment provides social support for employees within a large distributed organization.

Future work to build upon these findings includes a systematic evaluation of how team characteristics (e.g. stability, collocation) affect how employees obtain peer support and the circumstances under which they use an enterprise SNS for such activity. We also plan to conduct additional analysis of the non-English status messages to investigate geographic differences in user appropriation. While we provided an initial high-level analysis of the responses, a deeper

understanding of the answers and the factors influencing responses is necessary to improve the utility of microblogging as a medium for Q&A. Finally, prior work has suggested that the members of one's workplace network can play multiple relationship roles depending on the context (Wu et al., 2010). Our future research will investigate whether these roles influence whether or not responses are elicited and the types of response that are likely to occur depending on the relationship between the asker and answerer.

References

Ackerman, M. S., & Malone, T. W. (1990): 'Answer Garden: A tool for growing organizational memory', *Proceedings of COCS 1990*, pp. 31-39.

Ackerman, M. S., & McDonald, D. (1996): 'Answer Garden 2: Merging organizational memory and collective help', *Proceedings of CSCW 1996*.

Adamic, L. A., Zhang, J., Bakshy, E., & Ackerman, M. S. (2008): 'Knowledge sharing and yahoo answers: everyone knows something', *Proc.WWW2008*, pp. 665-674.

Balakrishnan, A. D., Matthews, T., & Moran, T. P. (2010): 'Fitting an activity-centric system into an ecology of workplace tools', *Proc.CHI2010*, pp. 787–790.

Bernstein, M., Tan, D., Smith, G., Czerwinski, M., & Horvitz, E. (2009): 'Collabio: A game for annotating people within social networks', *Proc.UIST2009*, pp. 97-100.

Camino, B. M., Milewski, A. E., Millen, D. R., & Smith, T. M. (1998): 'Replying to email with structured responses', *International Journal of Human Computer Studies*, *48*(6), 763-776.

Chudoba, K.M., Wynn, E., Lu, M., Watson-Manheim, B. (2005): 'How virtual are we? Measuring virtuality and understanding its impact in a global organization,' *Information Systems Journal*, 15, pp. 279-306.

Cross, R., Rice, R. E., & Parker, A. (2001): 'Information seeking in social context: Structural influences and receipt of information benefits,' *IEEE Transactions on Systems, Man, and Cybernetics, Part C*, *31*(4), 438-448.

DiMicco, J., Geyer, W., Millen, D. R., Dugan, C., & Brownholtz, B. (2009): 'People Sensemaking and Relationship Building on an Enterprise Social Network Site', *Proc.HICSS2009*, pp. 1–10.

DiMicco, J., Millen, D. R., Geyer, W., Dugan, C., Brownholtz, B., & Muller, M. (2008): 'Motivations for social networking at work', *Proc.CSCW2008*, pp. 711-720.

Donath, J. (2008): 'Signals in social supernets', *Journal of Computer-Mediated Communication*, *13*(1), 231-251.

Dunbar, P. R. (1998): *Grooming, Gossip, and the Evolution of Language*. Harvard University Press, Cambridge, MA.

Ehrlich, K., & Shami, N. S. (2010): 'Microblogging Inside and Outside the Workplace', *Proc.ICWSM2010*.

Farrell, S., Lau, T., Nusser, S., Wilcox, E., & Muller, M. (2007): 'Socially augmenting employee profiles with people-tagging', *Proc.UIST2007*.

Harper, F. M., Moy, D., & Konstan, J. A. (2009): 'Facts or friends?: distinguishing informational and conversational questions in social Q&A sites', *Proc.CHI2009*, pp. 759-768.

Kraut, R. E. (2003): 'Applying social psychological theory to the problems of group work', in J. Carroll (eds.): *HCI Models, Theories and Frameworks*, Morgan Kaufman, New York, 2003, pp. 325-356.

Leshed, G., Haber, E. M., Matthews, T., & Lau, T. (2008): 'CoScripter: automating & sharing how-to knowledge in the enterprise,' *Proc.CHI2008*.

Matthews. T., Matthews, T., Whittaker, S., Moran, T., Yuen, S. 'The New Organizational Ecology: Symbiotic Relationships Between Collaborations', *IBM Technical Paper*.

McGrath, J. E. (1984): *Groups: Interaction and Performance*. Prentice Hall, Englewood Cliffs.

Millen, D., Yang, M., Whittaker, S., & Feinberg, J. (2007): 'Social bookmarking and exploratory search', *Proc.ECSCW 2007*.

Morris, M. R., Teevan, J., & Panovich, K. (2010): 'What do people ask their social networks, and why?: a survey study of status message q&a behavior', *Proc.CHI2010*.

Morris, M. R., & Horvitz, E. (2007): 'SearchTogether: an interface for collaborative web search', *Proc.UIST2007*.

Morrison, E. W. (2002): 'Information Seeking Within Organizations', *Human Communication Research*, *28*(2), pp. 229-242.

Mortensen, M. and Hinds, P. (2002). 'Fuzzy teams: Boundary disagreement in distributed and collocated teams', in P. Hinds and S. Kiesler (eds), *Distributed Work*, MIT Press, Cambridge, MA, 2002, pp. 283-308.

Naaman, M., Boase, J., & Lai, C. H. (2010): 'Is it really about me?: message content in social awareness streams', *Proc.CHI2010*.

Nam, K. K., Ackerman, M. S., & Adamic, L. A. (2009): 'Questions in, knowledge in?: a study of naver's question answering community,' *Proc.WWW2009*.

Nardi, B. A., Whittaker, S., and Schwarz, H. (2002): 'Networkers and their Activity in Intensional Networks', *Computer Supported Cooperative Work*, 11, 1-2, pp. 205-242.

O'Leary, M., Mortensen, M., and Woolley, A. (2011): 'Multiple Team Membership: A Theoretical Model of Its Effects on Productivity and Learning for Individuals, Teams, and Organizations', *Academy of Management Review*. To appear.

Ribak, A., Jacovi, M., & Soroka, V. (2002): '"Ask before you search": peer support and community building with reachout', *Proc.CSCW2002*.

Shami, N. S., Ehrlich, K., Gay, G., & Hancock, J. T. (2009): 'Making sense of strangers' expertise from signals in digital artifacts,' *Proc.CHI2009*.

Thom-Santelli, J., & Millen, D. R. (2009): 'Learning by seeing: photo viewing in the workplace', *Proc.CHI2009*.

Thom-Santelli, J., Muller, M. J., & Millen, D. R. (2008): 'Social tagging roles: publishers, evangelists, leaders,' *Proc.CHI2008*.

Welser, H. T., Gleave, E., Fisher, D., & Smith, M. (2007): 'Visualizing the signatures of social roles in online discussion groups', *The Journal of Social Structure*, *8*(2).

Wu, A., DiMicco, J. M., & Millen, D. R. (2010): 'Detecting professional versus personal closeness using an enterprise social network site,' *Proc.CHI2010*.

Zhang, J., Qu, Y., Cody, J. and Wu, Y. (2011): 'A case study of microblogging in the enterprise: use, value and related issues', *Proc.CHI2010*.

Zhao, D., Matthews, T., Moran, T., Rosson, M.B. (2011): 'Microblogging's Potential Impact on Team Collaboration Awareness', *Proceedings of the International Conference on Collaboration Technologies and Systems 2011*.