
Sensemaking with Tweeting: Exploiting Microblogging for Knowledge Workers

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Abstract

Just because the rules surrounding microblogging services are simple does not mean that tools support for them should be simple too. Microblogging generates volumes of interesting social content, but there is a lack of frameworks and tools that allow us to exploit such information and enhance knowledge workers' sensemaking. Beyond adoption, we believe that new promising research directions on microblogging include designing and evaluating tools that extract and exploit social information. In this paper, we discuss a number

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of ways to exploit microblogging in support of two recurrent sensemaking tasks: (1) when a user is seeking information (information foraging and active exploration) and (2) when information is delivered to the user (awareness and passive monitoring).

Keywords

Microblogging, social media, search, sensemaking, information foraging, awareness.

ACM Classification Keywords

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

Introduction

As microblogging services have gained wide popularity, users have adopted them for novel purposes including personal information sharing, promoting political views, marketing, and tracking real time news [2][6]. In one particular extension of interest, industry and the research community [9] have begun to investigate how to adapt microblogging to work environments (SocialCast, Jive, Yammer, etc). These early attempts suggest that microblogging can be tailored to facilitate informal communication between colleagues and coworkers in an organization.

Microblogging has the potential to be a useful communication medium for knowledge workers [9], especially those who manage multiple projects and communicate with a large number of weak-tie coworkers. On the other hand, without careful design, enterprise microblogging can also cause workers to collaborate less efficiently, or completely discard the medium.

Direct repurposing of popular microblogging services into the enterprise setting is not trivial. For example, knowledge workers are generally against immediately replacing their current communication mediums like email and phones with microblogging services. Microblogging could be discarded as just another non-critical communication medium, especially if the workers are already overloaded with large amounts of information and numerous information channels. Moreover, knowledge workers face growing cognitive costs as their work becomes more fragmented across tasks and tools and the rate of task interruptions increases [4].

To integrate microblogging into the work setting, we believe that it is crucial to investigate (1) what techniques can be used to exploit microblogging information; and (2) how these techniques might enhance people's ability to make sense of information.

In this paper, we are particularly interested in two areas of innovation that we believe are most promising for this direction: (1) when a user is seeking information (information foraging and active exploration), and (2) when information is delivered to a user (awareness and passive monitoring).

INNOVATION AREAS

Table 1 outlines problems and technological solutions for each of two areas of innovation: i.e., exploiting microblogging to better support information foraging (or active exploration, top rows) and awareness (or passive monitoring, bottom rows).

Sensemaking and knowledge management involves activities such as search and exploration, collection management, organization of found content, and presentation. Microblogging services have a potential to enhance knowledge workers' sensemaking by facilitating informal communication.

INFORMATION FORAGING AND ACTIVE EXPLORATION

Across the tasks that involve foraging and active exploration, we identify the three following sub-areas where exploiting microblogging have room to create new value (i.e., better support) for knowledge workers.

Search: Microblogging services have a social norm of only sharing short messages (e.g., the 140 character limit in Twitter). While limits create a unique ecosystem around microblogging services such as URL shorteners and increased number of informal updates [2], it also introduces a new challenge to text-based search. Due to its short content and lack of link structure, not all traditional search algorithms work well on them. Since search plays an especially important role for knowledge workers, alternative search techniques are required to address these challenges. One approach we are pursuing is to adopt "term expansion" techniques as in Eddi, a personalized summarization service for Twitter [1].

Problems	Details	Example Technologies
<i>Innovation Area 1: Information Foraging and Active Exploration</i>		
Search	Messages are often too short for search algorithms to work efficiently.	Term expansion
Utilizing social context such as social relationships	Conventional algorithm is not utilizing social context of information (e.g., friend, friend of friend)	zerozero88.com, tie strength, social attention
Real-time information	Social media might do a better job of broadcasting and disseminating information during emergencies	USGS service for earthquake detection
<i>Innovation Area 2: Awareness and Passive Monitoring</i>		
Information overload	Too many pieces of information are available through multiple channels. Want to get a gist of the available information.	Help user to cover/optimize summarization, tag cloud
Multi-faceted information	Users want to filter the information according to multiple criteria (e.g. seeing only messages relating to a project, a certain timeframe, or group.)	Filtering, multi-faceted browsing
Sentiment analysis	Messages often contains opinionated point of views (e.g., I like/hate iPhone)	Sentiment analysis, product comparison for marketing

Table 1. Area of innovation – ways to exploit microblogging for knowledge workers

Utilizing Social Context: In contrast to the short textual content, microblog status updates come with a rich social context. Even a short message in Twitter has rich meta-information about its author, where the author currently is, who might be listening, and who has followed up. Such social context can be useful to determine the value of information. For example, one can put a different weight on the trustworthiness of a certain piece of information based on where the information comes from. We explored this angle in zerozero88.com, a personalized recommending service for interesting tweets [3].

Real-time information: Another important aspect of microblogging is its real-time characteristics. Real-time updates enable organizations to exchange up-to-date information that can be critical for emergency situations. For example, the American Red Cross

adopted Twitter to exchange information about local disasters including statistics and directions.

AWARENESS AND PASSIVE MONITORING

Microblogging has also a great potential for enhancing people's ability to monitor activities around them.

Information Overload: Knowledge workers are already suffering from information overload – receiving too many pieces of information through multiple channels. Work practices around microblogging have evolved to improve awareness, because the social norm is to scan the messages, instead of reading them in detail. Techniques that improve this scanning might include smart topical summarization that enables them to get a gist of the available information quickly.

Multi-faceted Information: The content in microblogging are associated with different purposes and not all of the information available in microblogging systems is useful to everybody [7]. Thus, targeted filtering (so as to reduce the noise) will help users to focus on a target task [5]. For example, one might want to see messages related to only a certain project at work.

Sentiment Analysis: As microblogging becomes popular, there are a large number of messages that contain "subjective" expression on products and social issues. With the proliferation of online content including reviews, ratings, and recommendations, microblogging becomes an important source of information for businesses looking to market products, identifying new opportunities or managing their reputations [8]. Therefore, we believe sentiment analysis for microblogging would be a fruitful area.

Our position is that there is a need to further explore the design space for techniques that might apply in microblogging systems. Summarization, recommendation, sentiment analysis, and faceted browsing are just a few examples of techniques that can better support knowledge workers' sensemaking.

Conclusion

Microbloggers need help filtering out the noise, understanding the conversations, identifying the relevant content and responding to information. This position paper describes potential sensemaking techniques that can be layered on top of microblogging. In particular, we might help knowledge workers to better forage for content and actively explore topics that they're interested in. We might also improve their

passive monitoring of social information streams by utilizing summarization and filtering techniques.

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