Modeling User Acceptance of Internal Microblogging at Work

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Abstract
In this position paper, we proposed a frame work of studying user acceptance of internal microblogging at work by discussing related theories and describing our data collection. We also reported several initial finding highlights.

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H4.3. Communication Applications

General Terms
Human Factors

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Introduction
Encouraged by the success of the popular micro-blogging site Twitter, many companies have started to adopted internal micro-blogging tools like Yammer. These tools allow company employees to securely share brief status updates about their daily activities and work with other employees. Many see internal microblogging as a new way to improve informal information exchange and social networking opportunities within corporations (e.g., [4]).

The small number of studies examining microblogging in the enterprise have described the uses, benefits, and costs of microblogging in corporate environments (e.g., [1][4]). However, to experience the potential benefits of corporate microblogging, a sufficient number of users must adopt the tool – something that is not trivial due to network effects and the cold-start problem. In this study, based on our previous work [3], we examine the adoption process, focusing on how a corporation's existing organizational structures and personal networks shape the way that Yammer was adopted. It is an important case study since, like many corporate social media endeavors, it began as a grassroots effort that slowly spread throughout the company rather than being a top-down traditional IT rollout project.

User acceptance

Like many social media tools, Yammer is best thought of as a social platform rather than a traditional single-user information technology. Adopting a social platform requires more than simply creating a user account or even posting a few messages. Full acceptance requires some amount of continuous activity, whether that includes reading or posting. In our analysis we differentiate between different levels of "acceptance" including:

- Initial adoption (registering an account)
- Continued use (continue login for either reading or posting)
- Contributing (posting content; following others)
- Promoting (inviting others)

Related Theories

We have built our work on three related theories:

IT acceptance theories: Different from traditional IT tools, Social media platforms are usually voluntarily adopted and more likely to impact one's work indirectly through maintaining and developing social relations and new informal communication channels. However, IT acceptance theory framework can still guide our research in valuable ways. IT acceptance theories summarize factors affect IT acceptance into four categories: performance expectancy, effort expectancy, Social Influence, and facilitating conditions [2].

Community participation theory: Researchers have studied factors that encourage contributions to virtual communities, as well as factors that encourage newcomers to stay active in a community (e.g., [5]). We will call upon this literature to understand how others' participation and community dynamics influence the likelihood acceptance [5].

Network Growth theory: Many corporate social media endeavors begin as grassroots efforts that slowly spread throughout the company through social networks rather than being top-down mandates like many traditional IT rollout projects. Network studies have modeled the dynamics of viral spreading by analyzing susceptibility rates, transition probabilities, and their relationships to network structure (i.e. [6]).

Methodology

Our study is based on a case study from a large fortune 500 company, XB (a pseudonym). Yammer was initiated by employees and is treated as grassroots social networking applications. Although the company has officially purchased the service, it is not promoted or mentioned in formal corporate communications. The following data sources are collected (see [3] for a more detailed description):

- 13 months of Yammer log data, including messages posted and network information of who invited whom and who follow whom. (initial finding below is based on first 5 months of data)
- Results from a survey about user's perceived values and costs of using Yammer that conducted in Jun, 2009 of 168 early adopters. We plan to conduct another survey soon, including those who were invited and declined to participate.
- Users' background information from HR records, including job function, title, salary range, location, etc. We are currently matching these up with survey and log data.
- Semi-structured interviews with 18 early adopters.

We have begun to perform social network analysis of the invitation and following networks and develop a regression model to predict different levels of acceptance (see above) based on users' background information, information on who invited them, and perceptions of Yammer from survey results.

Initial Finding Highlights

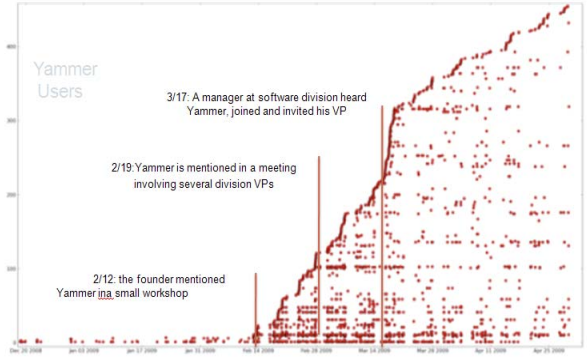

Figure 1. User joining and posting activity curve

Figure 1 shows the user joining and posting activity plot in Yammer. In this figure, each red dot line can be viewed as a posting life snapshot of a user with the corresponding user_id at Y axle. The beginning of the user line represents his joining time. The end of the user line is the time he or she last posted a message in our dataset. The user_id is sorted by the dates when users joined the network.

From this figure, we can see that Yammer adoption is staged. For instance, while Yammer is initially adopted by several users as early as November 2008, it is not picked up by a significant number of users until February 2009. Interviews with early adopters helped identify a few important events. Yammer was mentioned by the first adopter in an internal workshop on Feb 12th. The workshop involved about 20 people across the organization with an interest in social media related topics. These workshop participants joined Yammer after the meeting, and then invited their colleagues to join Yammer through either email invitation or offline conversations. Another important date was around March 17th, when more than 100 users joined in 3 days. This happened as it quickly spread through an existing organizational division, starting with a sub-division manager, who invited the VP of the division, who in turn invited other directors and colleague. These examples demonstrate how local events, existing workplace organizational structures, and email invitations helped facilitate the quick spread of Yammer across the organization.

Figure 2 shows the invitation network. In this figure, Arrows point from the inviter to the invited person. Only individuals who ended up joining Yammer are shown on the graph. Larger nodes invited more people (some of whom joined and some of whom didn't). Greener nodes had a high percent of acceptances, while redder nodes had a lower percent of acceptances. Black nodes have not sent an invite. Edges are darker the earlier they were sent. Components can be "read" from left-to-right, where those who initiate the invitation are toward the left side.

One important observation from Figure 2 is the importance of hubs (identified as large nodes) – individuals who invite many people to participate. Hubs are not necessarily the first to join the network, although some are. For example, the large component in the upper-middle section was largely a result of an

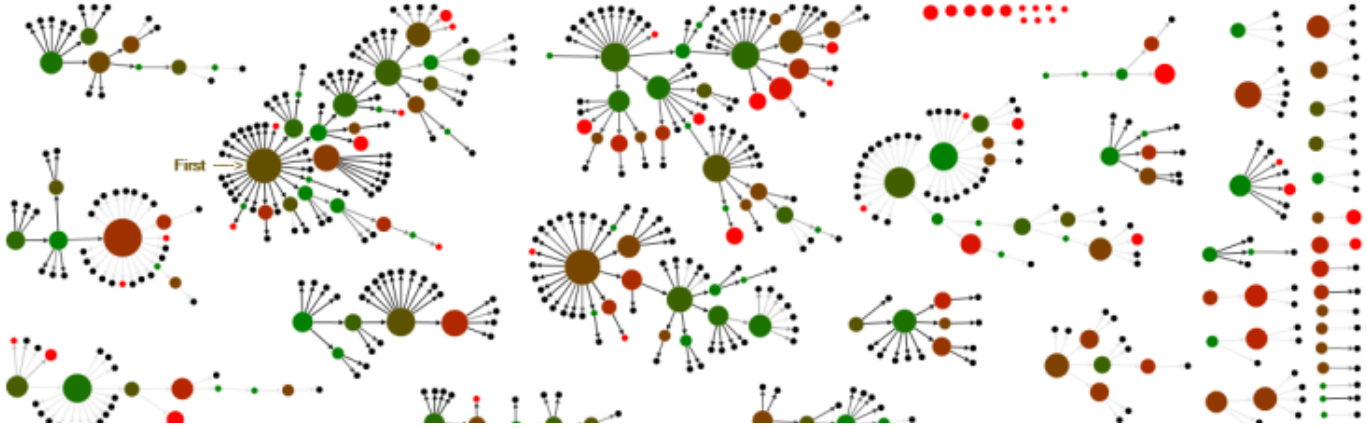

Figure 2: invitation network

active hub who was invited by someone who only sent one invitation. We are currently mapping HR data to this network to identify if the green hubs are organizational superiors (i.e., at a higher level) than those they invite. Likewise, we want to understand the demographics and organizational position of the red hubs are – those who send many invitations but have relatively few accepted.

Another important observation is visible by looking at the edges. Invitations by an individual and within a component are typically sent within the same time period (i.e., most edges within a component are the same darkness). This suggests that many individuals send out invites at a single time, and that invitations spread through a component rapidly. We are currently mapping data on location and work divisions to see how closely components in Figure 2 map to them.

Next Step Work

In addition to mapping the company HR information to social networks, we will build regression models that predict the likelihood of users' acceptance using the different levels of acceptance identified earlier (e.g., continued use). We also plan to compare our empirical data with theoretical network growth models [6] to develop models that are appropriate for enterprise adoption of social media tools.

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