Microblogging in Social Networks - A Survey

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Abstract: Microblogging, which has emerged as a new and popular tool for short and frequent communication, is increasingly influential in today's businesses and society. Sina-microblog, the most popular microblogging service in China, has established a large user base; however, different users have different using styles.Microblogging becomes popular and more and more people begin to use Twitter and Sina-microblog. We focus on properties of microblogging. As a social media, microblogging has social property and media property. This paper highlighted that survey responses and focuson social networking sites microblogging system, Micro-blogs change from conventional blogs in that their messages are characteristically shorter in terms of size. The research was conducted to understand the effect of the use of microblogging in social networks have on knowledge sharing. This research allows to have a better understanding of the conditions, intentions and behavior to share knowledge through the use of mircroblogs. This paper concludes by comparingmany existing process of the microblogging system in social network sites and some possible future research works to be conducted.

Keywords: Social networking sites; Microblogging.

1. INTRODUCTION

Social media has taken the Information Technology (IT) industry by storm. According to Grit, social media is an alternate media where online users generate online media and uses the content in it in these social networking sites (SNS). In fact most of us use social media applications such as Face book, Twitter, YouTube, Wikipedia, MySpace and other social websites to share private and public information where this knowledge is used for decision making activity. These user-generated content technologies include mircoblogs, blogs, wikis and social networking sites.

All these application are used to share videos, images, files and text messages. Even though these individual shares knowledge at the personal level as part of their personal life style, however, knowledge sharing activity in organizations remain a challenging and debatable issue among practitioners and researchers. Some claim that knowledge sharing among knowledge workers had shown significant improvement. For example, through blogs and social networking websites, users are connected to each other, sharing information and communicating in real-time. On the other hand, some related works claimed that the use of SNS is the cause of poor productivity among employees. This case investigation attempts to carry out a study with a IT shared services company by implementing an enterprise microblogging site.

Microblogging is a social media, which users can describe their current status within a limit of 140 characters. A user can follow any other user, and the user being followed need not follow back. Users can post tweets like video, audio and image through the website interface, SMS, or a range of apps for mobile devices [1]. It provides a light-weight, easy form of communication that enables users to broadcast and share information about their activities, opinions and status[2]. Microblogging developed rapidly. According the latest data by twocharts [3], Twitter has more than 500 million registered users. In China, Sina-microblog has more than 300 million registered users and 100 million tweets every day [4]. Microblogging becomes popular and more and more people begin to use Twitter and Sina-microblog.

However, what needs of users are met by microblogging and what is the significance? We focus on properties of microblogging. As a social media, microblogging has social property and media property. The property is always in dispute: Which property is stronger? Basically microblogging is considered as a social network, and helps users contact and communicate [5]. Researchers found that Twitter is more like a media, rather than a social network [6]. Different understanding of microblogging property will lead to different path of enterprises, so it's important to research on microblogging property. Uses and gratifications theory is often used to research on motives and communication results, an also it's a theoretical framework of new media [7]. Therefore, this study will apply uses and gratification theory to examine gratifications sought, gratifications obtained and user behaviors, to explore social and media property.

2. MICROBLOGGING

A. Microblogging

Microblogging is the practice of posting small pieces of digital content—which could be text, pictures, links, short videos, or other media—on the Internet. Microblogging has become popular among groups of friends and professional colleagues who frequently update content and follow each other's posts, creating a sense of online community. Twitter is currently the best-known microblogging site, its popularity supported by a growing collection of add-on applications that enable different and often more engaging microblog updates, such as TwitPic for uploading pictures or PollyTrade for buying and selling stocks. Meanwhile, a number of competing microblog applications—some open source, many aimed at specific interest groups—continue to challenge Twitter's popularity. This resulting profusion of tools is helping to define new possibilities for this type of communication.

B. Process of Microblogging

In mainstream culture, microblogging has become an extremely popular channel for both professional and personal pursuits. Friends use it to keep in touch, business associates use it to coordinate meetings or share useful resources, and celebrities and politicians (or their publicists) microblog about concert dates, lectures, book releases, or tour schedules. For higher education, microblogging is an increasingly important tool for communities of practice, enabling scholars to communicate informally on subjects of shared interest and to open windows into their own projects, sparking interest and discovery among peers. Some universities are considering using microblogging in the curriculum to emphasize timeliness, student engagement, and aggregation of artifacts relevant to course content and experience. At some institutions, faculty offer course-centric microblogging streams to create a backchannel among students in the classroom. Stephen Prothero, professor of religion at Boston University, has set himself the challenge of using Twitter to sum up eight major religions, in a maximum of 140 characters per post. The microblogs he offers will feed into a book that he is writing on the same topic.

C. Works of Microblogging

To post a microblog or to read those posted by others, subscribersmust typically create accounts, which are linked with cell phones,e-mail accounts, instant messaging, web pages—any mediumthey will use to send updates. Users can then post updates or"follow" the posts of other people. These posts might consist of short text snippets (maximum number of characters specified by the application), a photo, an audio clip, or a few seconds of video, any of which can be shared publicly or with a selected group of subscribers. As updates are added, they are aggregated into a personal stream of information, sometimes fused with updates from other users they have chosen to follow. Users tag posts with keywords so that others can search topics and follow comments and conversations. Those who have accounts at multiple services might use an aggregator such as FriendFeed or Socialthing, which deliver streams from several social networking sites to a single location and also allow customization of filters and streams.

3. REVIEWS ON MICROBLOGGING

Microblogging offers a portable communication mode that feels organic and spontaneous to many and has captured the public imagination. The promise of instant publication with few restrictions on content means that microblogging services can offer instant news coverage from individuals witnessing or directly involved in events as they unfold, something that can be especially valuable for issues not covered by traditional news sources. In the aftermath of the disputed recent presidential election in Iran, for example, official news outlets found access and communication restricted, but the microblogging world went into hyper drive as onlookers posted up-to-the-minute personal accounts from inside the country and followers elsewhere offered commentary. In such a context, microblogs may give voice to a segment of society that is otherwise not heard. Marketers follow posts on microblogging sites to track trends and mine data about the success of products, performances, or services. On a smaller scale, when used by work groups as a collaborative tool, a microblogging application can invite colleagues to share information while providing an easy means for them to stay connected through a project life cycle— from brainstorming to troubleshooting to evaluation.

Everyone's an Influencer: Quantifying Influence on Twitter proposed by EytanBakshy and Jake M. Hofman. In [1] investigate the attributes and relative influence of 1.6M Twitter users by tracking 74 million diffusion events that took place on the Twitter follower graph over a two month interval in 2009. Unsurprisingly, we find that the largest cascades tend to be generated by users who have been influential in the past and who have a large number of followers. We also find that URLs that were rated more interesting and/or elicited more positive feelings by workers on Mechanical Turk were more likely to spread. In spite of these intuitive results, however, we find that predictions of which particular user or URL will generate large cascades are relatively unreliable. We conclude, therefore, that wordof-mouth diffusion can only be harnessed reliably by targeting large numbers of potential influencers, thereby capturing average effects. Finally, we consider a family of hypothetical marketing strategies, defined by the relative cost of identifying versus compensating potential "influencers." We find that although under some circumstances, the most influential users are

also the most cost-effective, under a wide range of plausible assumptions the most cost-effective performance can be realized using "ordinary influencers"— individuals who exert average or even less-than-average influence.

Meme ranking to maximize posts virality in microblogging platforms proposed by Francesco Bonchi, Carlos Castillo, Dino Ienco In [26] Microblogging is a modern communication paradigm in which users post bits of information, or "memes" as we call them, that are brief text updates or micromedia such as photos, video or audio clips. Once a user post a meme, it become visible to the user community. When a user finds a meme of another userinteresting, she can eventually repost it, thus allowing memes to propagate virallytrough the social network. In this paper we introduce thememe ranking problem,asthe problem of selecting whichkmemes (among the ones posted by their contacts) to show to users when they log into the system. The objective is to maximize the overall activity of the network, that is, the total number of reposts that occur. We deeply characterize the problem showing that not only exact solutions are unfeasible, but also approximated solutions are prohibitive to be adopted in an on-line setting. Therefore we devise a set of heuristics and we compare them through an extensive simulation based on the real-world Yahoo! Meme social graph, using parameters learnt from real logs of meme propagations.

Centralized Class Specific Dictionary Learning for wearable sensors based physical activity recognition proposed by Sherin M Mathews, et al. In [33] this process address a novel technique for a sensor platform that performs physical activity recognition by leveraging a class specific regularizer term into the dictionary pair learning objective function. This algorithm jointly learns a synthesis dictionary and an analysis dictionary in order to simultaneously perform signal representation and classification once the time-domain features have been extracted. Specifically, the class specific regularizer term ensures that the sparse codes belonging to the same class will be concentrated thereby proving beneficial for the classification stage. In order to develop a more practical approach, we employ a combination of an alternating direction method of multipliers and a$l_1 - l_s$minimization method to approximately minimize the objective function. We validate the effectiveness of our proposed model by employing it on two activity recognition problem and an intensity estimation problem, both of which include a large number of physical activities.

Correlating Financial Time Series with Micro-Blogging Activity proposed by Eduardo J. Ruiz, VagelisHristidis. In [2] study the problem of correlating micro-blogging activity with stock-market events, defined as changes in the price and traded volume of stocks. Specifically, we collect messages related to a number of companies, and we search for correlations between stock-market events for those companies and features extracted from the microblogging messages.We present detailed experimental results measuring the correlation of the stock market events with these features, using Twitter as a data source. Our results show that the most correlated features are the number of connected components and the number of nodes of the interaction graph. The correlation is stronger with the traded volume than with the price of the stock. However, by using a simulator we show that even relatively small correlations between price and micro-blogging features can be exploited to drive a stock trading strategy that outperforms other baseline strategies.

A Content-Driven Framework for Geolocating Microblog Users proposed by Zhiyuan Cheng, James Caverlee, And Kyumin Lee. In [29] Highly dynamic real-time microblog systems have already published petabytes of real-time human sensor data in the form of status updates. However, the lack of user adoption of geo-based features per user or per post signals that the promise of microblog services as location-based sensing systems may have only limited reach and impact. Thus, in this article, we propose and evaluate a probabilistic framework for estimating a microblog user's location based purely on the content of the user's posts. Our framework can overcome the sparsity of geo-enabled features in these services and bring augmented scope and breadth to emerging location-based personalized information services. Three of the key features of the proposed approach are: (i) its reliance purely on publicly available content; (ii) a classification component for automatically identifying words in posts with a strong local geo-scope; and (iii) a lattice-based neighborhood smoothing model for refining a user's location estimate. On average we find that the location estimates converge quickly, placing 51% of users within 100 miles of their actual location.

Dictionary and deep learning algorithms with applications to remote health monitoring system proposed by Sherin Mary Mathews. In [34] In this dissertation, present three dictionary learning approaches and a deep learning framework for classification tasks related to remote health monitoring systems. This dissertation presents a more robust class specific centralized dictionary learning method to solve the wearable sensor-based physical activity classification problem. Inspired by experiments that achieved high recognition rates using a few representative samples on high dimensional data, we explore the physical activity recognition signals from wearable sensors and propose a dictionary pair learning-based framework for human physical activity monitoring and recognition. The essential strategy involves integrating the class specific centralized regularizer term into the dictionary pair learning objective function and efficiently optimizing the objective function by combining the alternating direction method of multipliers and the $l_1 - l_s$ minimization method. Specifically, the class specific regularizer term ensures that the sparse codes belonging to the same class will be concentrated thereby enhancing the classification performance.

Mining Social Networks Using Heat Diffusion Processes for Marketing Candidates Selection proposed by Hao Ma, Haixuan Yang, Michael R. Lyu and Irwin King. In [10] presents three diffusion models, along with three algorithms for selecting the best individuals to receive marketing samples. These approaches have the following advantages to best

illustrate the properties of real-world social networks: (1) We can plan a marketing strategy sequentially in time since we include a time factor in the simulation of productadoptions; (2) The algorithm of selecting marketing candidates best represents and utilizes the clustering property of real-world social networks; and (3) The model we construct can diffuse both positive and negative comments on products or brands in order to simulate the complicated communications within social networks. Our work represents a novel approach to the analysis of social network marketing, and is the first work to propose how to defend against negative comments within social networks.

Microblogging Content Propagation Modeling Using Topic-specific Behavioral Factors proposed by Tuan-Anh Hoang and Ee-Peng Lim. In [11] When a microblogging user adopts some content propagated to her, we can attribute that to three behavioral factors, namely, topic virality, user virality and user susceptibility. Topic virality measures the degree to which a topic attracts propagations by users. User virality and susceptibility refer to the ability of a user to propagate content to other users, and the propensity of a user adopting content propagated to her, respectively. In this process, we study the problem of mining these behavioral factors specific to topics from microblogging content propagation data. We first construct a three dimensional tensor for representing the propagationinstances. We then propose a tensor factorization framework to simultaneously derive the three sets of behavioral factors. Based on this framework, we develop a numerical factorization model and another probabilistic factorization variant. We also develop an efficient algorithm for the models' parameters learning. Our experiments on a large Twitter dataset and synthetic datasets show that the proposed models can effectively mine the topic-specific behavioral factors of users and tweet topics.

Probabilistic Latent Tensor Factorization Framework for Audio Modeling proposed by Ali TaylanCemgil. In [32] introduces probabilistic latent tensor factorization (PLTF) as a general framework for hierarchical modeling of audio. This framework combines practical aspects of graphical modeling of machine learning with tensor factorization models. Once a model is constructed in the PLTF framework, the estimation algorithm is immediately available. We illustrate our approach using several popular models such as NMF or NMF2D and provide extensions with simulation results on real data for key audio processing tasks such as restoration and source separation

Leveraging discriminative dictionary learning algorithms for single lead ecg classification proposed by Sherin Mary Mathews. In [35] Detecting and classifying cardiovascular diseases and their underlying etiology are necessary in critical-care patient monitoring. In this work, explore the effectiveness of discriminative dictionary learning algorithms for electrocardiogram (ECG) classification task and exhibit that they can achieve very competitive performance compared to traditional methods with lower computational cost. Demonstrate dictionary learning and classification processes simultaneously following the detection of supraventricular and ventricular heartbeats using a single-lead ECG. Label information for each dictionary atom is incorporated to enforce discriminability in sparse codes during the dictionary-learning process. Such a discriminative label-consistent learning procedure for adapting both dictionaries and classifier to a specified ECG signal, rather than employing pre-defined dictionaries is novel.

The effectiveness of the proposed algorithms is demonstrated on real ECG signals from the MIT-BIH arrhythmia database. The performance of the algorithm is evaluated in terms of classification accuracy, sensitivity, positive predictive value and false positive ratio. The results demonstrate a classification accuracy of 94.61% for Supra Ventricular Ectopic Beats (SVEB) class and 97.18% for Ventricular Ectopic Beats (VEB) class at sampling rate of 114 Hz on MIT-BIH database. Therefore, a sampling rate of 114 Hz provided enough discriminatory power for the classification task.

Earthquake Shakes Twitter Users: Real-time Event Detection by Social Sensors proposed by Takeshi Sakaki, Makoto Okazaki, and Yutaka Matsuo. In [14] produce a probabilistic spatiotemporal model for the target event that can find the center and the trajectory of the event location. We consider each Twitter user as a sensor and apply Kalman filtering and particle filtering, which are widely used for location estimation in ubiquitous/pervasive computing. The particle filter works better than other compared methods in estimating the centers of earthquakes andthe trajectories of typhoons. As an application, we construct an earthquake reporting system in Japan. Becauseof the numerous earthquakes and the large number of Twitter users throughout the country, we can detect an earthquake by monitoring tweets with high probability (96% of earthquakes of Japan Meteorological Agency (JMA) seismic intensity scale 3 or more is detected). Our system detects earthquakes promptly and sends e-mails to registered users. Notification is delivered much faster than the announcements that are broadcast by the JMA.

Maximum Correntropy Based Dictionary Learning Framework for Physical Activity Recognition Using Wearable Sensors proposed by Sherin M Mathews, et al. In [36] Physical activity recognition is difficult due to the inherent complexity involved with different walking styles and human body movements. Thus we present a correntropy induced dictionary pair learning framework to achieve this recognition. Algorithm for this framework jointly learns a synthesis dictionary and an analysis dictionary in order to simultaneously performsignal representation and classification once the time-domain featureshave been extracted. In particular, the dictionary pair learning algorithm is developed based on the maximum correntropy criterion, whichis much more insensitive to outliers. In order to develop a more tractable and practical approach, we employ a combination of alternating direction method of multipliers and an iteratively reweighted method to approximately minimize the objective function. Here validate the effectiveness of our proposed model by employing it on an activity recognition problem and an intensity estimation problem, both of which include a

large number of physical activities from the recently released PAMAP2 dataset. The Higher-Order Singular Value Decomposition: Theory and an Application proposed by GöranBergqvist and Erik G. Larsson. In [31] many areas of science and technology, data structures have more than two dimensions, and are naturally represented by multidimensional arrays or tensors. Two-dimensional matrix methods, such as the singular value decomposition (SVD), are widespread and well studied mathematically. However, they do not take into account the multidimensionality of data. In some scientific areas, notably chemometrics and psychometrics, tensor methods have been developed and used with great success since the 1960s for the analysis of multidimensional data.

4. CONCLUSION AND FUTURE WORK

Microblogging network has positive impact on using amount and the total sample explain microblogging network at a 6.9% level, so we further investigate relationship between satisfactions and using amount within different size of microblogging network.This study enriches academic research in microblogging, especially in understanding basic property of microblogging, which paves the way for future studies. Besides, microblogging user behaviors are described in two aspects, one is using amount including frequency and time length, and the other one is microblogging network including number of followers and followings, which can measure user behaviors better.

Additional, media satisfactions have positive impact on use behaviors, so if users are more satisfied with media property, they will use microblogging more frequently and longer. Microblogging has an advantage of timeliness than traditional media. Everyone is news source and microblogging is an effective information platform for real-time news and emergencies. As of a broad group of users, Sina-microblog needs to focus on information reliability and authenticity. We advise Sina-microblog to set up related rules and laws, assisted with online rumors teams to ensure that information is accurate to avoid users churn and unsatisfied.

Future research can compare different microblogging service because different microblogging provide different services and relationship between user satisfactions and user behaviors may be different. As to research object, future research can follow user report by China Network Information of Center of China (CNNIC) and apply sample survey to study the whole users.

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