Opinion Mining From Blogosphere for Analysis of Social Networking

Amruta S. Dulange, R.B.Kulkarni, Supriya S. Ambarkar

Abstract—Blogs are most common medium over web where user posts their opinion. It is considered to be a web space of the users where they share their views, beliefs and other philosophy. The blogs are generally categorized of two types: Itemized blogs, where the user posts his views and opinions against a web news or news item and personal blogs where users posts random topics of their interest under the header of their choice. As more and more number of users publish their data over the web, it becomes significant that Meanings are extracted from blog and they are indexed properly for information retrieval. In this work we develop a crawler to read data from RSS feeds of blogs and save them locally. Finally we apply data mining technique to index the blogs for easy searching and information extraction.

Index Terms— Web Mining, Blog, Blog Search, Blog Mining

I. INTRODUCTION

The mining of opinions in textual materials such as Weblogs adds another dimension to technologies that facilitate search and analysis of particular entity. This paper focuses on identifying readers/customers viewpoint about a subject, rather than simply identifying the subject itself. Analyzing text regarding its opinions can be extremely valuable to a legal researcher who is looking for a perspective on a legal issue or even information about a product or a service. Organizations may also benefit from automatic opinion mining by obtaining a timely picture of how their products or services, or more generally their names, are perceived by their customers. The Web is an expanding environment where customers go to find or submit opinions that may be ripe for mining.

II. BACKGROUND

Web mining is a specific area of Data Mining, and is defined as the process of discovering knowledge, such as patterns and relations, from Web data. Web mining is generally divided into three main areas: content mining, structure mining and usage mining. Each one of these areas are associated to the three predominant types of data found in the Web[19].

Web content mining from the document described its contents or takes a course of interesting knowledge, is a web-based content of the elements of the target Web mining. These elements have targeted text and hypertext data as well as graphics, images, and other multimedia data; both from the database of structured data, it also uses XML tags of HTML or semi-structured data and unstructured text of the free. Mining is the structure of the Web page from the hyperlink found in its structure and its relationship with each other. Through to find hidden in a page after the link structure of the model will be able to take advantage of this model on the Web page re-classification, can also be used to find similar sites. Based on the hyperlink topology, Web mining structure can be classified pages summed up the page and site structure, such as the generation of similarity between the Web site, the relationship between the Web site. Web Usage Mining is the user "visit marks" to obtain valuable information on the Web log data and data mining[21]. These data include: client, server-side data and data-side proxy. Web Usage Mining can be divided into general and special access to track the path of track. The former is used KDD (Knowledge Discovery in Database) to visit the general understanding of the technical patterns and trends, such as Web log mining; the latter is an analysis of each and every time the user visits the model, on the basis of these sites will automatically Mode Built structures, such as adaptive site. Web use records of the excavation is aimed at forecasting the on-line users, compared with the actual site and look forward to the use of the difference, according to the user’s interest to adjust structure of the site. Blogs are likely to represent a single individual or a group. Blog information may differ from other kinds of text. For example, blogs are not always likely to be as well edited, as newspaper or magazine text.
In contrast to other forms of text, blogs may use incomplete sentences and phrases. Individual blogs can have a huge impact and bloggers can gain substantial unsavory reputation. Blogs have also been used as the basis of generating information to predict sales.

Tomoyuki Nanno and his colleagues present architecture for collecting and monitoring blogs in Japanese [1]. Other researchers have studied how marketers use text mining techniques to analyze customers’ opinions and reviews on the Web [2]. However, researchers created these systems for blog collection or Web page text mining only, so you can’t apply them directly to blog mining applications.

Knowledge discovery in blogs is different from knowledge discovery in areas such as databases or Web documents due to blogs’ unique characteristics, which introduce additional mining challenges. Although researchers have investigated several techniques to address different aspects of blog discovery, no comparisons among key knowledge discovery techniques for blogs exist [3]. This article examines three prominent techniques that are frequently applied to discovery in blogs — clustering, matrix decomposition, and ranking. The authors Geetika T. Lakshmanan & Martin A. Oberhofer compare them in terms of effectiveness in combating present challenges and their ability to accomplish challenging tasks required for effective blog mining. [3]

Gruhl et al. [9] apparently were among the first to examine the use of information from blogs as a basis to predict sales when they analyzed Amazon book sales. They found that peaks to discussions (chatter) in blogs were likely to be followed by sales peaks. Mishne and Glance [16] extended that work by noting that the nature of the chatter (positive, negative, etc.) also helped in the prediction of sales.

III. BLOGS, BLOG SEARCH AND BLOG MINING

Blogs are websites that provide content often generated by individuals. An analysis of “icrocket.com” provides many examples of the types of topics that are found in blogs: Technical, financial, political, entertainment, and news. Virtually, anyone can blog. There are few filters in place to limit blogs or what is in them. As a result, there are millions of blogs. However, since the information is coming from so many different sources, at so many different times, there may be real information, not previously realized or recognized, that is embedded in the blogs.

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A. Blog search

A number of search engines, including Technorati, Yahoo and Google, provide the ability to search blogs for specific concepts or issues. These search engines allow users to easily find blogs that contain pre-specified chunks of opinionated text. For example, “AMAZING” would allow finding all of the pages with the appropriate set of opinion-oriented text. Such search engines can be employed by other software to generate information and insights[22].

B. Blog mining

Blog mining is the process of searching and analyzing blogs in order to generate additional insights that might otherwise not be found by examining a single blog[23]. If blogs contain information and knowledge, whether tacit or explicit, by analyzing and “mining” the information in them, we can begin to make assertions, particularly in those settings where we are able to pull together information and knowledge from multiple different blogs. Blog mining tries to create an overall understanding of information from the disparate sources.

Marketing researchers and companies have long been interested in capturing information and knowledge about the opinions of buyers or potential buyers of their products. However, interviewing people about their opinions is time consuming and costly, and there is concern if the individual is telling the truth or telling the marketer what they want to hear. In contrast, blogs provide a readily available and opinion-based content media that provides sentiment about a range of issues. As a result, being able to use those blogs for gathering opinion information potentially can provide a low cost source of information about those opinions and sentiment, regarding particular issues and concerns, gathered in real time.

IV. OPINION CAPTURED IN BLOGS

Every Blog site provides a forum for bloggers to present opinion, ratings, sentiment and information about a range of issues. Although bloggers may use pictures, links, Dilbert cartoons, and videos, in this paper we are primarily concerned with the expression of opinion using text only.

A. Opinions and sentiment

Humans generally are able to distinguish between positive and negative opinions, although the case of sarcasm can make it difficult. However, it is difficult for humans to distinguish between neutral positions and opinion bearing positions. As a result, the goal for a computer program is to determine a similar set of perspectives, but it is more likely that such programs will be able to determine positive or negative positions.

B. Sample opinion word dictionary

<table>
<thead>
<tr>
<th>+ve verbs</th>
<th>-ve verbs</th>
<th>Positive adjectives</th>
<th>Negative adjectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Love, like</td>
<td>Hate, dislike</td>
<td>Good,best,better, happy, fantastic, extraordinary, successful, glad, desirable, worthy, remarkable, funny, lovely, perfect, nice, impressive, decent, beautiful, entertaining, fascinating, brilliant, gorgeous, amazing, splendid, distinctive, desirable, excellent, great, awesome, fabulous</td>
<td>Bad, awful, suck, worse, worst, poor, annoying, and stupid</td>
</tr>
</tbody>
</table>

Table 1 : Sample of opinion word dictionary
V. METHODOLOGY

The working of the work and the methodology can be described through following figure.

In above Fig 2 , a blog reader is essentially a XML parser that reads the XML feed from the blogs. These feeds provide information about the topics and the URL of the blogs. Here the feed data is first stored as a plain text locally in the system and then this plain text is given as input to the indexer. Indexer indexes the files based on information and using maximum likelihood based indexing. Indexed data is stored in the database for fast querying and searching.

VI. APPROACH

A. Indexing the collection

The feeds are pages in RSS/Atom format. Each RSS feed represents a single channel, with metadata for title, URL, description, generator, language and a list of items. Each item contains elements such as title, URL for the content, URL for the comments, description, date, creator and category. Atom feeds use slightly different naming but contain similar metadata and items.

B. Identifying content

A topic can be considered as a representative of the bloggers interest in real world events. A topic can vary from the commercial launch of a product like the Apple’s new iPod to variations in political policies. But unfortunately blog pages are messed up with all sort of extra information besides the blog post and the reader’s comments: pages often include lists of similar related pages, annotated lists of previous posts, other reviews, navigation bars, side bars, advertising, etc. If we indexed the page as a normal HTML page, all the text in these parts would end up in the index, leading to results with poor relevance. To avoid this here we deal specially with blogs generated by programs which follow well defined markup rules allowing the post’s content to be identified. Here numbers of blogs are aggregated from few blog sites which are well-liked in India like WordPress, Technorati, Yahoo and Times of India. Each generator creates pages with a specific markup style. For instance WordPress encloses the posts within a <div class="post"> element, and the post head within a <H2 class=post-head> element. Comments are enclosed in a <DIV class="commentlist"> element. Blogger instead uses div’s post, postbody and <div id="comments"> to enclose comments. For these most used content generators, we created a list of elements to be included.

C. Opinion Mining

Once we get HTML structure of a blog of our interest we can extract the comments by filtering it from the rest of code. Suppose ‘A’ is our topic of interest then there may be ‘n’ number of blogs written on it on multiple different sites. By using the GUI provided for comment extraction, we can extract comments from each individual blog on ‘A’ and these are finally grouped under title ‘A’[15]. These comment set grouped into cluster which contains satisfactory rang of comments extracted from desperate sources. As we are examining number of blogs on same topic we may get multiple clusters which are stored locally for further procedure.

D. Search Strategy

At the beginning of search operation aggregated index of
the entire document within the cluster is formed. Such aggregated indexed data is now forwarded for searching. As the blog data is updated in our repository, the tool can periodically build an index using the Lucene search and indexing library. This feature can be used similar to a traditional search engine for the data sources currently indexed by the system[20].

The search engine now will perform look for opinions which matches the keyword entered through interface provided for searching.

For example to search for type: 

[OPINIONATED: 'United States']

This will return all documents where opinionated word occurs within the document. By using subjective word classifier we can easily distinguish between positive and negative comments or we can enter any keyword which reflects the mood of comments.

e.g. If we enter the word agree, good, like or anything which may be considered as positive or in favor will be matched & result will be displayed for it.

VII. RESULTS AND ANALYSIS

Following GUI shows the Interface for extracting data/opinion from Blog. We can select any blog site from listed sources and Fetch XML Content from it. Once a link is selected the main story and the blog with its comments appears. After clicking Get, the Page Source of fetched blog will get stored locally on the system as a text file which is our training sample for mining of opinions. Mining procedure can be conducted by extracting user post from the text file and by simply running our mining evaluator which indexes each node we can address each blog with the result showing positive/negative perception of users/customers on it.

This evaluator is executed by considering documents (opinion) on below stated subjects from yahoo, Technorati and times of India’s blog sites. And for each subject we have referred number of blogs and extracted hundreds of opinionated text for analyzing polarity of opinions. Following table 2 is the blog sources which we have considered for evaluation; similarly we can use the same evaluator to work with hundreds of blog posts from disparate sources.

<table>
<thead>
<tr>
<th>Blackberry 10</th>
<th>On Galaxy S IV Launch</th>
</tr>
</thead>
</table>

![Fig 5 a] Interface for extracting data/opinion from Blog.](image)

![Fig 5 b) Interface for extracting data/opinion from Blog.](image)

![Fig 5 c). Search Returns fast result showing the score, source file location & keyword in a sample file.](image)
Micromax

- BlackBerry says an unnamed partner has ordered 1 million BlackBerry 10 phones. - By Brad Reed
- BlackBerry shares surge on huge order for new devices. -by Euan Rocha
- BlackBerry promises to update its Android emulator to run Jelly Bean apps. -by Dan Graziano
- BlackBerry Z10 sell-outs continue in new markets, but sales said to be slowing in Canada, U.K. -by Zach Epstein

<table>
<thead>
<tr>
<th>Micromax</th>
<th>Windows 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 smartphones in a year? Slow down. Micromax. -By Javed</td>
<td>Windows 8 still used less than Vista despite slowing gaining traction in 2013. - By Dan Graziano</td>
</tr>
<tr>
<td></td>
<td>Windows 8 is no Vista, but still considered polarizing. - By Brad Reed</td>
</tr>
<tr>
<td></td>
<td>WINDOWS 8: GOOD, BAD AND UGLY -BY JAVED ANSWER</td>
</tr>
</tbody>
</table>

Table 2: Blogs referred for mining of opinions. According to this evaluation our runs obtained the following scores as shown in table 3. Positive column give you an idea about the percentage of people who liked the product and have focused on its positive features. Similarly next column for negative shows that people that has not accepted it and shared their reason of refusal. As people always talk about products affordability and compare the cost and features with the other one and they may declare it as an expensive product. Non opinionated results are presented with the neutral column.

<table>
<thead>
<tr>
<th>Subject</th>
<th>Positive opinion</th>
<th>Negative Opinion</th>
<th>Over Priced</th>
<th>Neutral</th>
</tr>
</thead>
<tbody>
<tr>
<td>BlackBerry 10</td>
<td>19%</td>
<td>11%</td>
<td>18%</td>
<td>44%</td>
</tr>
<tr>
<td>Nokia Lumia</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Windows 8</td>
<td>24%</td>
<td>37%</td>
<td>-</td>
<td>39%</td>
</tr>
<tr>
<td>Nexus 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HTC Butterfly</td>
<td>46%</td>
<td>12%</td>
<td>24%</td>
<td>8%</td>
</tr>
<tr>
<td>Miramax Smartphone</td>
<td></td>
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</tr>
</tbody>
</table>

Table 3. Score obtained after examining result of search.

VI. CONCLUSION

Blog Mining is an important aspect of web mining and the web data analysis. As most of the modern day news are debated online and the user opinions are presented online, it becomes important for developing tools which can not only extract correlated blogs but also gets an overview of independent and in turn generalized overview of the blogs. Many algorithms are proposed in this direction. Most of these papers are organized to detect the categories in the blogs only and do not present a comprehensive overview of the entire technique of fetching the RSS blog data and analyze them on the fly. In this work we developed an entire lifecycle of fetching and analyzing the blogs for mining information. The technique is based on similarity of the blog with its subject matter and the presence of opinion in such correlated blogs. The result shows a significant similarity with human perception. The technique can be further improved by incorporating machine learning technique with the current algorithm for better learning of the opinions in the blogs.

REFERENCES

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