SONETA: A Social Media Geo-Trends Analysis Tool

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Social media provide businesses with a great opportunity for monitoring customer views about their products or their brand. However this valuable information is hidden often in large amounts of data. So there is a need for new tools that filter data and enable businesses to find easily relevant information.

Recently research that focuses on methods and tools that enable users to gain insight into social media data have received significant attention. The main goal of these tools is to help users easily recognize useful information within large amounts of data. For example Marcus et. al. [1] introduced a system for real-time visualization and summarization of events on Twitter using timeline-based display that highlights peaks of high activity. TwitterMonitor [2] detects trend topics from Twitter streams. Bhulai et al. [3] use dynamic squarified treemap for visual representation of trending topics on Twitter. Wanner et al [4] used shape based visualizations for representing trend and sentiment. In addition, there are many commercial tools visualizing social media information [6, 7, 8, 9, 10, 11,12].

Locality of generated information in social media data (the geo factor) is often neglected in such tools. Geographic location of customers is however important for businesses [5]. Geographic segmentation of customers helps marketers identify the specific needs of their customers. This is especially true for multi-national businesses as well as for Small and Medium Enterprises (SMEs). Even though SMEs may not use geographic segmentation marketing, they are interested in understanding customer needs in the specific geographic area in which they are active. It is also of high importance to provide the ability to observe fluctuations over time in these locally identified trends and provide semantically rich trends even in non English text.

In order to meet these needs, we created an experimental prototype that is able to detect social media trends in specific geographic areas, called SONETA (Social Networks Analysis Tool). These trends are defined as the most important related terms around a user defined topic, keyword or phrase. Users can define a keyword and a geographic location for tracking and receiving the most important keywords on the Twitter stream (see fig.1a).

Our main goal was to provide appropriate data visualizations to the user so that he can quickly recognize important information from a stream of unstructured data. Quantitative results are first presented in the form of timeline of total number of tweets per day that contains the predefined keyword (Figure 1b). The user can choose among 3 visual representations (wordclouds, treemaps and bubbleclouds) in order to view the results (figure 1c). The timeline representation was used in order to provide a spatial position of the trends [6]. Regarding representations of individual days we chose to use *wordclouds*, powerful representation of textual data as has been proven

in previous cases [7]. Additionally we added another 2 visual representations, *treemap* using the size and the color of the rectangles to represent the importance of the keyword and *bubblecloud* where again the size and the color represent the importance of the keyword.

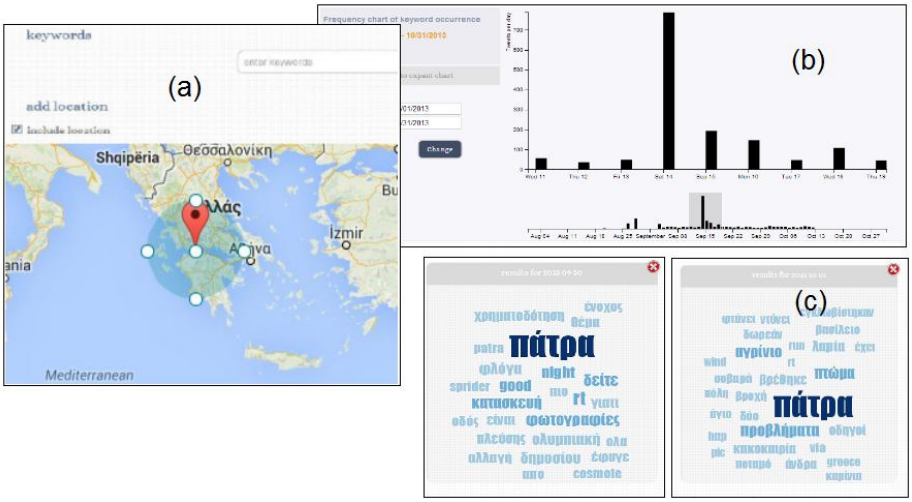

Figure 1: SONETA: (a) definition of geo-trend loaction, (b) timeline of tweets per day, (c) wordcloud of specific days, selected from (b).

The SONETA tool was evaluated in the case of 3 SMEs with diverse profiles (a software house, a research group and a travel agent). The purpose of the evaluation was twofold: first to determine its usefulness and second to draw conclusions about the usability of the tool.

First results of the preliminary evaluation study suggest that geo-location and top trends visualization of social media data that SONETA tool provides, are particularly useful in the business domain. Although conceptually the tool was perceived as useful, the companies that participated in the study had difficulties at first in finding appropriate usage in their everyday activities. After a brief introduction though, they started using SONETA effectively. Examples included the identification of the main subjects of interest of the users in specific location and time frame (in the city, last week), in order to decide on a new promotion campaign, ideas of sentiments in relation to selected keywords in different countries, etc. It was also found that these kind of tools, may help a small or medium enterprise in defining effective strategies in relation to social media presence and use. In relation to this, it was found out that example scenarios of use of the tools can facilitate considerably first time user experience and good practices.

In conclusion, through the design of the SONETA prototype and the subsequent user studies, it was confirmed that social media data can be used to gain insight into customer needs and thoughts for various businesses. In particular, location-related trends and related keyword visualizations were identified as valuable features supporting business social media strategies and effective use.

References

[1] Marcus, A.; Bernstein, M. S.; Badar, O.; Karger, D. R.; Madden, S.; and Miller, R. C. 2011. Twitinfo: aggregating and visualizing microblogs for event exploration. In Proceedings of the 2011 annual conference on Human factors in computing systems, CHI '11, 227–236. New York, NY, USA: ACM

[2] Michael Mathioudakis , Nick Koudas, TwitterMonitor: trend detection over the twitter stream, Proceedings of the 2010 international conference on Management of data, June 06-10, 2010, Indianapolis, Indiana, USA

[3] Bhulai, S., Kampstra, P., Kooiman, L., Koole, G., Deurloo, M., Kok, B.: Trend visualization in Twitter: what's hot and what's not? In: Data Analytics 2012, The First International Conference on Data Analytics, pp. 43–48. IARIA, Barcelona 2012

[4] F. Wanner, A. Weiler, and T. Schreck. Topic Tracker: Shape-based visualization for trend and sentiment tracking in twitter. In Proc. of the 2nd IEEE VisWeek Workshop on Interactive Visual Text Analyis, 2012

[5]Pickton, David & Broderick, Amanda: Integrated marketing communications, 2.edition

[6] Heer, J., Bostock M., Ogievetsky, V. :A Tour through the Visualization Zoo,Communications of the ACM 53(6), 59 2010

[7] McNaught, C., & Lam, P. 2010. Using Wordle as a Supplementary Research Tool. The Qualitative Report, 15(3), 630-643

[6]http://foller.me

[7]http://www.infomous.com

[8]http://www.twitscoop.com/

[9]http://trendsmap.com

[10]http://hashtagify.me/

[11]http://twazzup.com

[12] http://www.tweetarchivist.com