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# Measuring social networks for real-time competitive advantage

Singapore Management University

# MEASURING SOCIAL NETWORKS FOR REAL-TIME COMPETITIVE ADVANTAGE

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Social networks offer up a goldmine of information just waiting to be exploited. For the first time, human relationships, comments and activities are documented quite publicly on platforms like Facebook and Twitter. Save for privacy concerns, never before has it been easier to know what people think, what they like, and to whom they are connected.

Web forum content and individual comments made on blogs and news sites now serve as a new feedback source for market researchers, who use such channels to analyse consumer reactions, sometimes, to "crowd-source" innovations and solutions. On a more advanced level, web data can be used to predict short term likelihoods in matters relating to finance, economics or even politics.

In Thailand, for example, it was noted that the newly elected political party had used social media aggressively in its election campaign. Then again, elsewhere in Southeast Asia, it was also noted that candidates who were most prolific in their use of social media were not voted in at Singapore's 2011 general election. This has led some academics to argue that the online responses are overhyped and largely inaccurate. Or are they?

"People leave footprints in the sand. They interact much more with each other now, and leave digital traces of their interactions on the web," said Michael Macy, a Cornell University sociology professor, at the 3rd International Conference on Social Informatics (SocInfo 2011), hosted by Singapore Management University's School of Information Systems (SIS).

Macy illustrated his point with the findings of a large-scale sentiment and mood study on Twitter. He could tell, for instance, the percentage of people who are likelier to tweet later during weekends, and predict that most of these tweets would be more positive.

**Challenges for social media research**

Not many studies have been conducted on social media users in Asia – despite the region's high internet penetration rates and the general popularity of social networking sites. It was recently noted that Singaporeans spend some 80 per cent more time on Facebook compared to their British or American counterparts.

To be fair, researchers in such areas will have to confront several challenges. Firstly, internet use remains disparate across the region. A third of the Chinese population may have internet access, but the contrast is stark between urban centres and rural areas. Studies would thus only reflect the interests of the wealthy and educated.

Secondly, analyses within the region will have to take into account local equivalents of Twitter and Facebook. Comparisons will not be valid if one ignores the multitude of websites, such as Renren, Pengyou, Tudou or Weibo – all highly popular social networks in China. With more sites to learn and understand, researchers have to worry too, about neutrality and benchmarks.

Sentiment analysis is also expected to be much tougher in Asia due to greater restraints on expression. Asians have a tendency to express themselves in a more neutral way, compared to Westerners. Reading between the lines thus becomes more important for those who wish to make sense of the information.

Interpretation without prior knowledge of the culture will lead to inaccuracies. "Singaporeans may write in 'Singlish', which is the local dialect – a mix of English with a touch of several Asian languages," noted Lim Ee Peng, a professor of information systems at SIS and co-director of the university's Living Analytics Research Centre. So if researchers do not take into account cultural nuances and slangs, they will misinterpret or miss out on their findings.

"Moreover, Asians, especially those living in developing countries, mainly use their mobile phones to connect to social media. Messages via these phones are consequently shorter, simpler than those in blogs and emails; occasionally ridden with abbreviations and mistakes," he added. This presents challenges, especially for content analysis software.

It is also be interesting to note that Asian concepts of social media 'friendships' can be quite different from the West. Study has shown that Singapore, Philippines and Malaysia Facebook users are more active than rest of the world. The reciprocity in social exchange among Chinese may also bring about more friendships among Chinese users as they use online social media. This is visible on Weibo, the Twitter equivalent in China where one can easily gain a lot of followers," he said.

**Social media and its business uses**

As more and more consumers read both consumer and professional reviews online before making purchase decisions, businesses can no longer afford not to address customer concerns. Though virtual word-of-mouth comments are often subjective, or worse, fraught with bad logic and hidden agendas, studies have shown that these messages may still have something to offer.

Past studies have shown that the sheer quantity of online stories and comments can be telling of consumers' general reception towards a business proposition. And, like it or not, social networks will reinforce opinions through expedited repetition. Whether these expressions are truthful or otherwise may be immaterial.

Sentiment analysis applies to the world of finance as well. By looking at finance forums and business news sites, researchers have been able to explain financial market movements. Outside of academic research labs, some traders already use software to scan and skim through online data, from Twitter feeds to news, in order to get ahead of their competition.

Financial data mining, a relatively recent phenomenon, represents one of the many quantitative tools that predict share price movements with complex mathematical formulas. Such uses of technology have created what is known as [high frequency trading](), where computers deploying thousands of bids per second scramble to provide traders with an edge over others.

The first step of financial data mining is to gather and sort through the abundant material online. It begins with corporate communication channels, then onto financial news and analytical research, and then to individuals' comments on blogs and forums.

Media coverage analysis has been a major focus in the attempt to predict share price movements. Today, computers leap into action in milliseconds whenever Bloomberg releases a news headline. Victor Lavrenko, one of the pioneers in financial news analysis, found that keywords about a company can influence stock price direction. Another researcher, Paul Tetlock, found that unusually high or low pessimism, as found in media reports, can predict high market trading volume.

Some researchers have gone as far as to model trader success using data from finance-related news, along with share prices. Two professors, H. Chen and R. Schumaker, developed a programme called Arizona Financial Text System (AZFinText) that employs linguistic, financial and statistics techniques to predict likely discrete share prices within 20 minutes after news publication.

Though the programme certainly cannot read text like a human trader, it digested large amounts of information very quickly. In a 2005 test, AZFinText outperformed most traders, placing as the fifth highest performing global quantitative fund, returning 8.5 per cent, with a directional accuracy of over 71 per cent.

Hsinchun Chen, a professor leading the Artificial Intelligence Lab at the University of Arizona, who analysed Wal-Mart news published on the Wall Street Journal, Yahoo! Finance (information and comments), and forums (employees, unions and management), found that sentiment correlates with stock returns and trading volume the following day. Moreover, the longer, more numerous and more negative the messages, the more volatile and highly traded the stock.

Chen's second version of this 'AZ Stock Tracker' took stakeholder analysis into account and has a 60 per cent predictive accuracy, he announced at SocInfo 2011. He added that while the amount of messages can suggest volatility, returns remain difficult to predict.

All in all, automated trading errors can create losses large enough to wipe out many previous gains. Until the day sentiment analysis proves itself capable of beating traders at their game, research into perfecting such new-age crystal balls will likely continue.