

SentiMetric
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Reflecting the world's opinion

Start Making Sense... of Online Opinions

A SentiMetric White Paper

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The Problem

Corporate managers are facing unprecedented changes in the way in which consumers are expressing and sharing opinions about their brands, products and services. In the past, consumers shared their views through (spoken) word of mouth, leading to a long period of latency before a brand's weakness or strengths were known to all.

Know what your customers are saying about you – in real time. Today, users express themselves in millions of bulletin boards, blogs, and social networking site – a.k.a the blogosphere. The following chart shows how the number of *new blogs per day* has changed over the last few years.

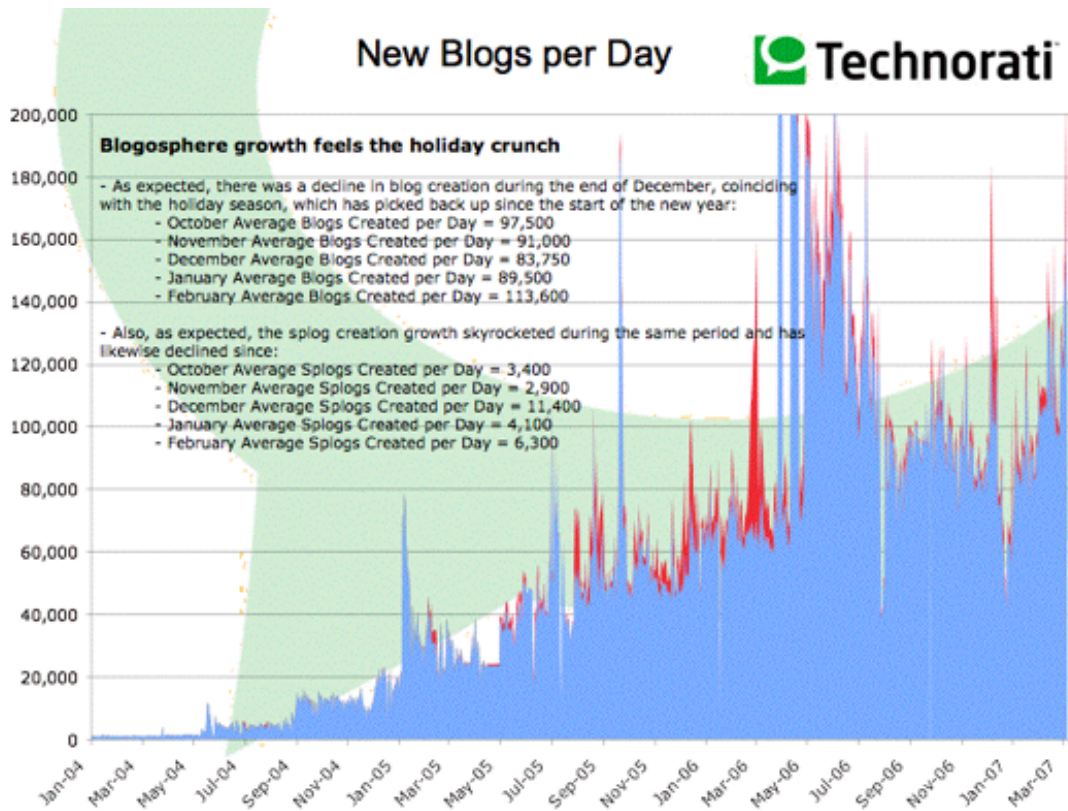


Figure 1. Sifry's reports on the State of the Blogosphere, www.sifry.com/alerts/archives/000493.html

These sites are read by thousands – sometimes millions – of consumers who quickly form an opinion of a brand. As the chart above shows, over 100K new blogs can be created on a single day! When one considers additional media outlets such as Facebook and Twitter, the number of comments increases even more dramatically, creating an echo-chamber that can reinforce opinions expressed. With traditional monitoring techniques, weeks – sometimes months – may pass before the company realizes that their carefully constructed brands have been trashed in these informal media outlets.

Comments made in blogs and social media outlets can also help a company reposition its products against the competition, highlighting strengths and overcoming weaknesses through an appropriate blend of advertising, marketing, and product engineering. **However, if you don't know what is being communicated about your brand in the blogosphere, you are flying blind.**

SentiMetrix delivers real time analysis of the blogosphere -- with high levels of accuracy that enables companies to quickly identify trends in opinions about their brands. The SentiMetrix solution enables managers to identify changes just when they start occurring rather than after they have occurred, and remain tuned into what people are saying about a brand.

Fine-grained analysis of customer opinions is a must. It is not enough to count the number of positive, negative, or neutral articles about a brand. While this provides an extremely coarse summary about the buzz surrounding a brand, it is too coarse to flag changes in sentiment about a brand *before* the changes are large enough to hurt the brand. For example, if buzz in blog and social media about a camera's battery life are flagged early, the company owning that brand can react quickly, highlighting the strengths of the product and making other adjustments while negotiating a deal with a better battery vendor. Such changes in sentiment do not happen overnight – they may take a few days to go from “positive” to “negative”.

SentiMetrix brings a unique technology that scores sentiment on a continuous scale ranging from -1 (“maximally negative”) to +1 (“maximally positive”). Thus, if a camera's daily scores started at 0.8, and gradually worked its way down to -0.1 over a period of 90 days, a system that scores sentiment as positive/negative/neutral would detect this change only after 90 days, while SentiMetrix's technology would detect the slide as soon as it started, giving company executives a substantial lead time within which to formulate a strategy to address the problem. SentiMetrix patent pending technology provides the fine grained analytics and information enabling managers to find and fix issues before a crisis happens and to quickly discover and reinforce positive trends.

Globalization increases brand monitoring complexity. A further complication is the global nature of brands today. Campbell's Soup, Sony cameras, and Volkswagen cars all have a global brand. People talk about them all over the world. Sometimes, opinions expressed in one country may be dramatically different from those expressed about the same product in another country. For example, opinions expressed in Japan about a Sony camera may vary dramatically from opinions expressed in Italy about the same product. Such variations in opinion about a product may be due to any number of factors: the marketing and advertising budget may be inadequate, or the product might be inappropriately designed with respect to local consumer preferences, or may be priced out of reach of the people in that country.

Brand managers need the ability to target their resources in order to maximize the effectiveness of the brand's position in a geographic market. Without a detailed knowledge of the language in question, it is impossible to analyze the impact of the brand in the social media surrounding that language.

The blogosphere has experienced an unprecedented increase in the number of foreign language posts as shown in the following chart.

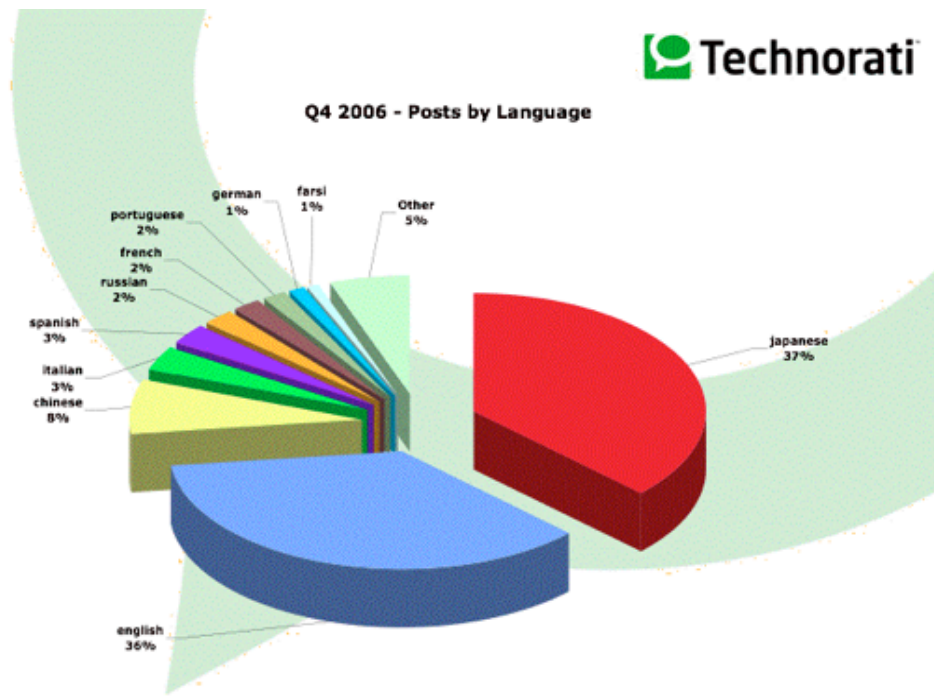


Figure 2. 1 Sifry's reports on the State of the Blogosphere, www.sifry.com/alerts/archives/000493.html

Brand monitoring methods must take this diversity of language – especially foreign languages such as Chinese, Italian, Spanish, French, and Russian which represent large markets for many of these brands. SentiMetrix's product addresses *all* of these languages with the exception of Farsi – the only player in the market with this capability.

Drills down capabilities are a must. Merely knowing that 50% of all articles about a product are positive, 30% are negative, and 20% percent are neutral is not enough. This is what most vendors of sentiment mining products sell today. However, customers want to know why these sentiments about their brand or product are distributed in this manner. Why are the 30% of unhappy social media posts unhappy? What are they complaining about? What are the best liked features of the brand or product?

For example, customers may be extremely happy with the interior design, safety and handling of a particular automobile, but unhappy with the gas mileage. Without knowing these important facts, product or brand executives are at a loss to react. A comprehensive opinion analysis product will help explain not just what consumers are saying, but why they are saying it.

SentiMetrix's patent-pending technology supports drilling down into the details of the opinions expressed so that the "why" question can be answered. Specifically, SentiMetrix's patent pending technology provides the ability to deliver feature level opinion ratings for a product (e.g. cameras our automobiles) or service (e.g., restaurants, home repairs) – providing answers about "why" sentiment regarding a product or service is being expressed in a given manner.

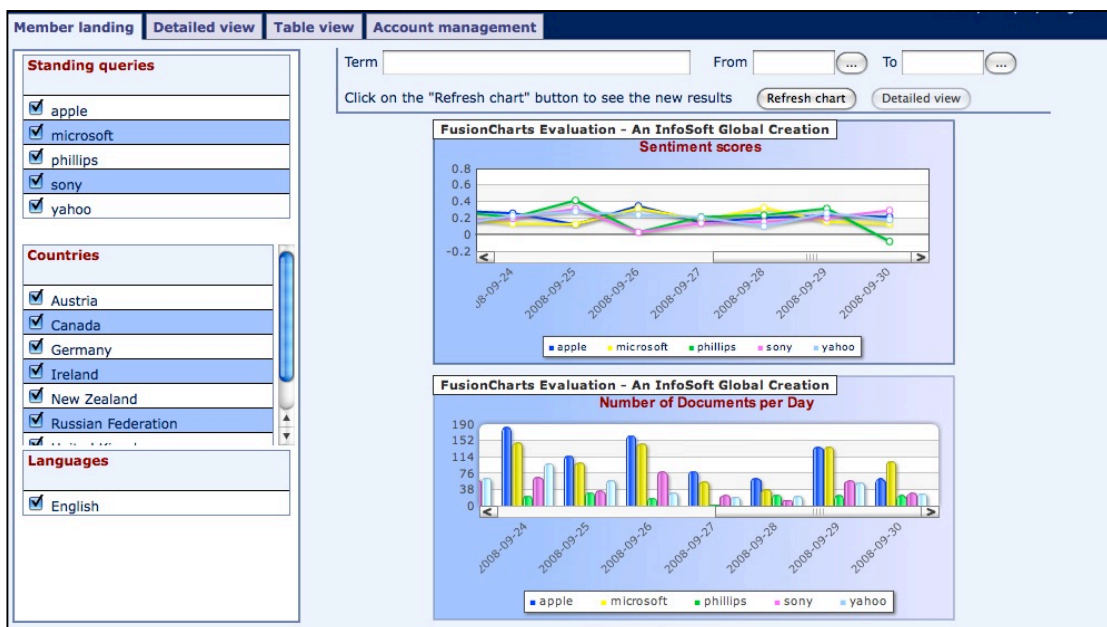
Highly accurate results are a must. While all vendors of sentiment mining and opinion tracking products claim high degrees of accuracy, SentiMetrix's product has submitted its product to independent, third party testing that validates this claim. *Our entire product* was shipped to an independent testing company to conduct exhaustive tests on behalf of a client. The testing proved the accuracy of SentiMetrix's product.

The SentiGrade™ Product Line

SentiMetrix offers a real-time, highly accurate, multilingual product that provides a fine-grained lens into how sentiments about a brand, product, or company are changing over time.

The SentiGrade™ product is offered as a service in two modes:

***SentiGrade App** - SentiGrade application is a full features solution for finding, analyzing and tracking opinions expressed on line. This SaaS based web application enables users to log-in and define search terms (products, services, company names, brand names, etc.) and configuration parameters from a browser. SentiMetrix's crawler identifies relevant articles from the numerous blogs we track and enables users to define additional websites that are relevant to the analysis. Graphical results are displayed in the web-based application and can be automatically delivered to the customer via email - see figure below.*



The screenshot shows the SentiGrade web application interface with a data table. The table has columns for dates from 2008-09-30 to 2008-09-24 and rows for brands: apple, microsoft, phillips, sony, and yahoo. The table also includes a 'Show scores' button and 'Export into spreadsheet' link.

	2008-09-30	2008-09-29	2008-09-28	2008-09-27	2008-09-26	2008-09-25	2008-09-24	2008-09-
apple	0.22	0.24	0.21	0.15	0.35	0.13	0.26	0.29
microsoft	0.13	0.16	0.33	0.18	0.32	0.13	0.14	0.2
phillips	-0.08	0.32	0.24	0.22	0.03	0.42	0.21	0.29
sony	0.3	0.21	0.16	0.14	0.04	0.32	0.2	0.16
yahoo	0.18	0.26	0.11	0.21	0.24	0.28	0.23	0.11

SentiGrade Service - SentiMetrix's web service enables companies to send a feed of articles, documents or URLs of articles to the SentiGrade engine. The engine automatically processes the articles and sends scores back in a simple XML format – enabling customers to integrate the results into new or existing systems, processes and work-flows.

In either case, users get the benefit of the very robust, highly scalable SentiMetrix opinion engine – accurate results, granular opinion scores and multi-lingual support.

How SentiGrade Scores Sentiment

At the very heart of SentiMetrix's product is a highly accurate SentiMetrix opinion scoring engine. When SentiGrade™ identifies an article relevant to a query topic (such as the brand "Mattel"), it first retrieves blogs and news articles relevant to Mattel and analyzes their content using a mix of natural language processing and statistical methods. Those parts of the article that directly or indirectly reference Mattel are identified. For instance, if the article talks both about Mattel and Fisher-Price, the sentences identified for Mattel may be different from those identified for Fisher-Price, though some overlap is possible.

The linguistic structure of each of these sentences is then carefully analyzed. Using a sophisticated, patent pending scoring model, SentiGrade™ analyzes how combinations of adverbs, verbs, adjectives, and negation occur in these sentences, and use statistically valid methods to provide a score reflecting the sentiment expressed about the query topic by the article. For example, the sentence "The drug DDD was extremely effective in treating my son's symptoms" can be viewed positively because of the presence of the phrase "extremely effective". On the other hand, the sentence "The drug DDD was effective in treating my son's symptoms" is still positive, but not as positive as the previous sentence because of the absence of the adverbial modified "extremely". The SentiGrade™ technology is capable of capturing such subtle variations in the strength of sentiment.

In addition, SentiMetrix's patent pending technology allows vertical specific phenomena to be taken into account when scoring sentiment. For instance, the sentence "Car XXX provides 12 miles per gallon in city traffic" might be viewed as a negative statement about the brand XXX. Likewise, a sentence such as "Researchers observed that the pain medication YYY appears to lead to increased episodes of stroke" may be viewed as a negative statement about the medication in question. SentiMetrix's patent pending technology is capable of capturing such subtleties.

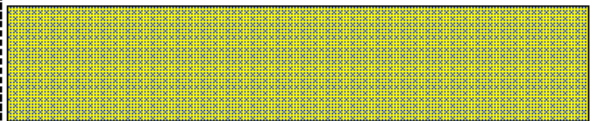
Thus, the same article may provide a 0.5 score for Mattel and a -0.2 score for Fisher-Price because the opinions expressed about these brands in that article might be different.

SentiGrade & Continuous Scoring

Most existing attempts to score sentiment classify articles as being positive or negative about a query term, or positive/negative/neutral. However, such classifications are overly coarse grained and would miss out on important changes in sentiment about a brand.

SentiMetrix Score - .52

The World Bank suddenly discovers 400 more million poverty-ridden people by Damien Millet and Eric Toussaint [Global Research](#), September 15, 2008



This reflects the lack of reliability of statistics published by the WB and shows that their main objective is to back up the neoliberal policies imposed by its own experts the world over. As can be read in its press release.[1] 1.4 billion people in the developing world (one in four) were living on less than US\$ 1.25 a day in 2005, while previous estimates were around 1 billion. Yet the WB still finds grounds for rejoicing, since what matters in its eyes is not the number but the proportion of poor people. Why is this? Because with a rampant world demography, the latter figure can more easily suggest improvement: if for instance the number of poor people does not increase, the proportion will automatically fall with the passing years. [2]

This is why the Millennium Development goal is to reduce by half the proportion of people living on less than a dollar a day between 1990 and 2015. But given the WB's huge mistakes in its accounts, the set of current international policies against poverty collapses. Structural adjustment policies (reducing social budgets, cutting costs in the field of health and education, an agriculture geared to export with consequent reduction of staple food crop cultivation, relinquishing food sovereignty, etc.) that have been enforced by the IMF and the WB since the early 1980s have seriously worsened living conditions for hundreds of millions of people throughout the world.

There has been a lot of criticism of the WB in this respect since Thomas Pogge, professor at Columbia University, wrote recently: The World Bank's accounting policies are most questionable. We have good reason to think that with a more credible method we would observe a more negative trend and more widespread poverty. [...] As long as the WB's current method and the data it produces are used by international organisations and university research on poverty, the problem cannot really be considered seriously. [3]

The WB has exposed its weakness both statistically and politically. More than ever our objective must be threefold: turning away from the logic of structural adjustment, doing away with the WB, and developing a new international institutional architecture.

Damien Millet, spokesman for CADTM France (Committee for the Cancellation of Third World Debt, www.cadtm.org), author of L'Afrique sans dette, CADTM/Syllepse, 2005.

For example, opinions about a brand such as Nabisco may be 0.8 today, and drop by 0.05 on each succeeding day. A method that just classifies opinion as positive or negative would take 16 days to report a change in sentiment. In contrast, SentiGrade's™ technology would flag these changes almost immediately, giving the company a few weeks of lead time to take actions that *prevent* the further erosion of positive sentiment about the brand.

SentiGrade™ is based on the award-winning University of Maryland OASYS Opinion Analysis System that won the 2006 Computerworld Horizon Award for innovative pre-commercial software. SentiMetrix holds the exclusive license to commercialize OASYS and has spent 18 months perfecting this technology and bring it to market. OASYS - on which patents are pending – was the first technology to do continuous scoring.

SentiGrade's Multilingual Capabilities

SentiGrade™ is the only multilingual sentiment mining technology we are aware of and is based on the first, true and tested system for sentiment mining in multiple languages. It currently supports tracking sentiment in English, Italian, Spanish, French, German, Chinese, Korean, Russian and Arabic. Selected other languages are being added to the system.

In order to handle foreign languages, SentiGrade™ uses an effective architecture that leverages whatever computational resources already exist for the language in question. Whether it is a machine translation program or a language parser or a word sense disambiguation program, SentiMetrix has developed processes to best utilize such resources in quickly constructing new language capabilities. Of course, the more computational resources exist for a language, the faster it is to build an accurate sentiment analyzer for the language.

SentiGrade Accuracy

SentiGrade™ has been independently tested for accuracy both by the University of Maryland and by an independent corporation contracted by the US Government to test new products for accuracy¹.

In the University of Maryland's tests of SentiGrade™, a set of human evaluators scored the sentiment of randomly selected news articles on various topics on the same -1 to +1 scale. SentiGrade™ also computed sentiment scores for the same test sample. A statistical test called a Pearson Correlation Coefficient was used to identify the correlation between the scores provided by the human evaluators and the SentiGrade™ scores.

The correlation between the human evaluators and SentiGrade™ was 0.59 on a -1 to +1 scale (-1 denotes a 100% inverse correlation and +1 denotes the fact that the two scores are exactly identical). The experiments also computed the average correlation between any two of the human evaluators – this average correlation between the humans was 0.57. Thus, SentiGrade™ performs within the range of scoring of an ordinary human evaluator.

In the second set of accuracy testing done by a large for-profit corporation on behalf of the US Government, tests were conducted on Burma blogs, Amazon reviews, and newspaper articles. According to the draft report, one of the strengths of SentiGrade™ was that “Sentiment scores generally track with actual sentiment of document”. They also asserted that “OASYS [the core technology in SentiGrade™] is suitable for transition. The software met the parameters of the testing and usability.”

¹ Testing completed by Science Applications Incorporated (SAIC) on behalf of US Intelligence Agency during March 2008.

In addition, the accuracy of the SentiGrade™ scores is attested to by customer testimonials. For example, a former World Bank official who used the SentiGrade™ system states that “I am very pleased with how accurate the algorithm is and how it enriches the system”.

Conclusion

Given the rapidly increasing role the blogosphere is playing in forming, changing or enhancing opinions for a company’s brand, it is now essential for organizations to track and analyze opinions expressed online. The SentiGrade software is powered by our highly accurate SentiMetrix opinion scoring engine -- providing the granular results and multi-language support needed to turn analysis into action.