A Design Science Analysis of a Monitoring System: A Case Study

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Keywords - Focus

- Continuous Monitoring
- Business Intelligence
- Analytics
- Unstructured Information (Text analysis)

The Internet has information that is useful for a wide range of uses

- Market Analysis of
  - Own Company
  - Own Products
  - Own People
- Business Intelligence of
  - Competitors
  - Competing Products
  - Competitors Employees
- Business Intelligence of
  - Customers
  - Vendors
  - Suppliers

Increasing Digital Media Requires Continuous Monitoring (1/2)

- There has been a virtual explosion of social media.
  - On a typical day there are over 500 million Tweets. In addition, there are roughly 150 million blogs on the Internet, and a virtually uncountable number of product evaluations and message sites available ranging from Amazon and Ebay to many smaller sites.
  - Users of those sites are constantly making assessments of organizations' products, people and other issues.
  - Information is generated continuously and timing of information is constant, particularly in a global economy.
- As a result, firms, brands and reputations constantly are being established and challenged on a wide range of Internet forums, in blogs, in microblogs, in message boards, on store comment sections and in news releases.

This Paper …

- Provides a case study that summarizes a continuous monitoring system that can be used to analyze each of those settings to generate business intelligence.
- In fact, it would seem that ultimately each firm or group of firms needs a system that can continuously monitor
  - The specific company
  - Its customers
  - Its partners
  - Its competition
- Need to create approaches and analytics to capture the appropriate information

COBRA-Corporate Brand and Reputation Analysis is designed to …

- Help managers gather and interpret information from social and other digital media about their brand and reputation, including gathering information about sentiment and key influences.
- Use underline text and data analytics to mine and interpret the massive, diverse content of social media, as well as internal corporate information *("What are customers saying about the our company?");*
- Monitor what consumers say about a company, its competitors, its customers, etc. using social media *("What are customers saying about our key competitors?");*
- Generate insights into consumer preferences and buying habits from postings across social media (*"How are customers affected by food ingredients?"*)
- Obtain early warning of impending threats to a company (*"How do customers feel about government actions in the food industry?"*)
- Determine what is being said about executives (*"Has there been any discussion about what the company's president said at that meeting?"*)

How the System Works

- The basic back and front end architectures are summarized in figures 1 and 2.

- Information is gathered from a wide range of digital media. Information is extracted, transformed and loaded into a data warehouse for various reports and analyzes.

- Alerts are generated when certain conditions are realized. As part of capturing and analyzing the information a number of developments are generated to support the system's activities.

Architecture (1/2)

Architecture (2/2)

Identify Brands and Issues of Concern

Management's issues of concern are captured and "models" of their concerns are generated.
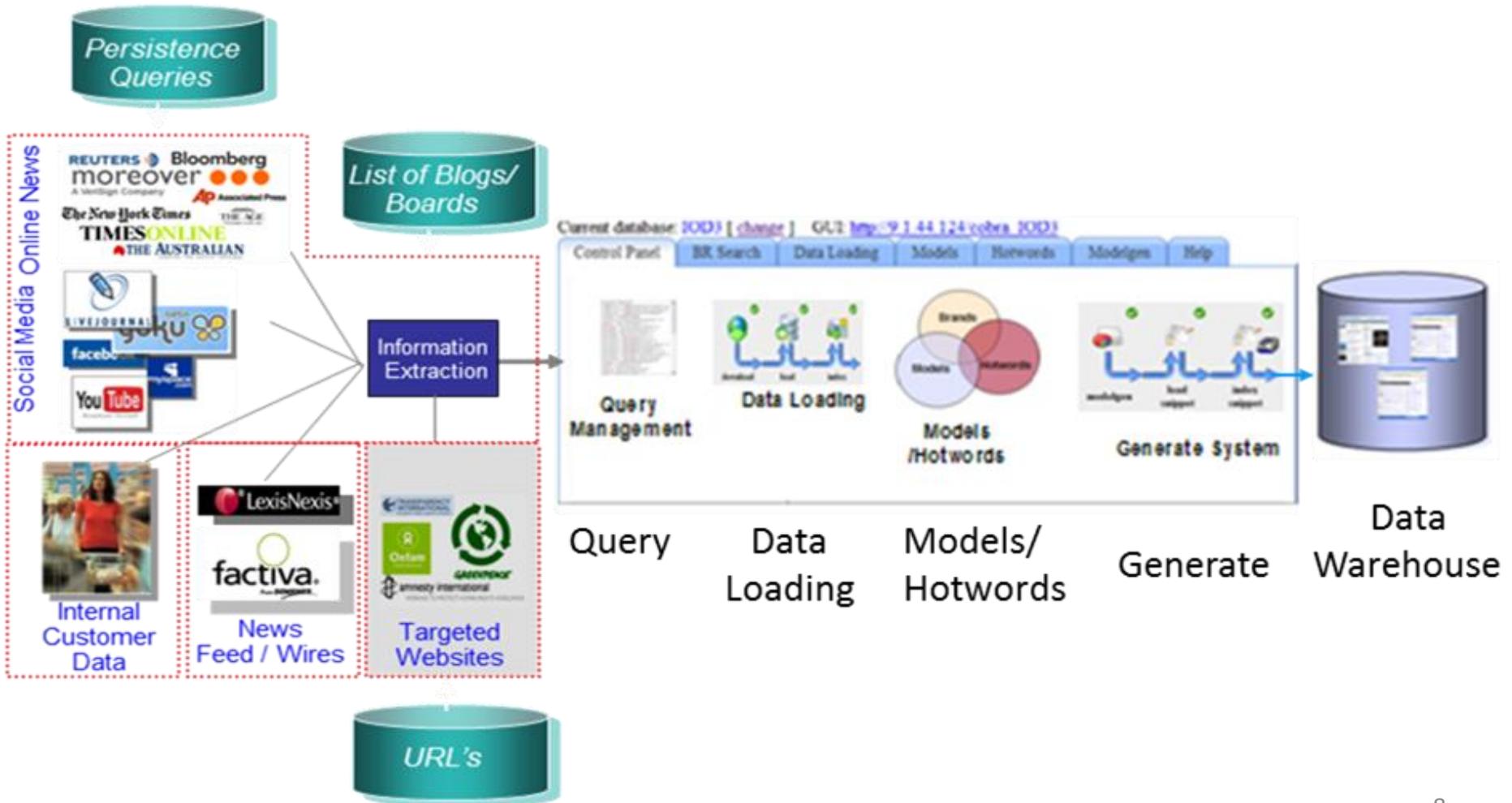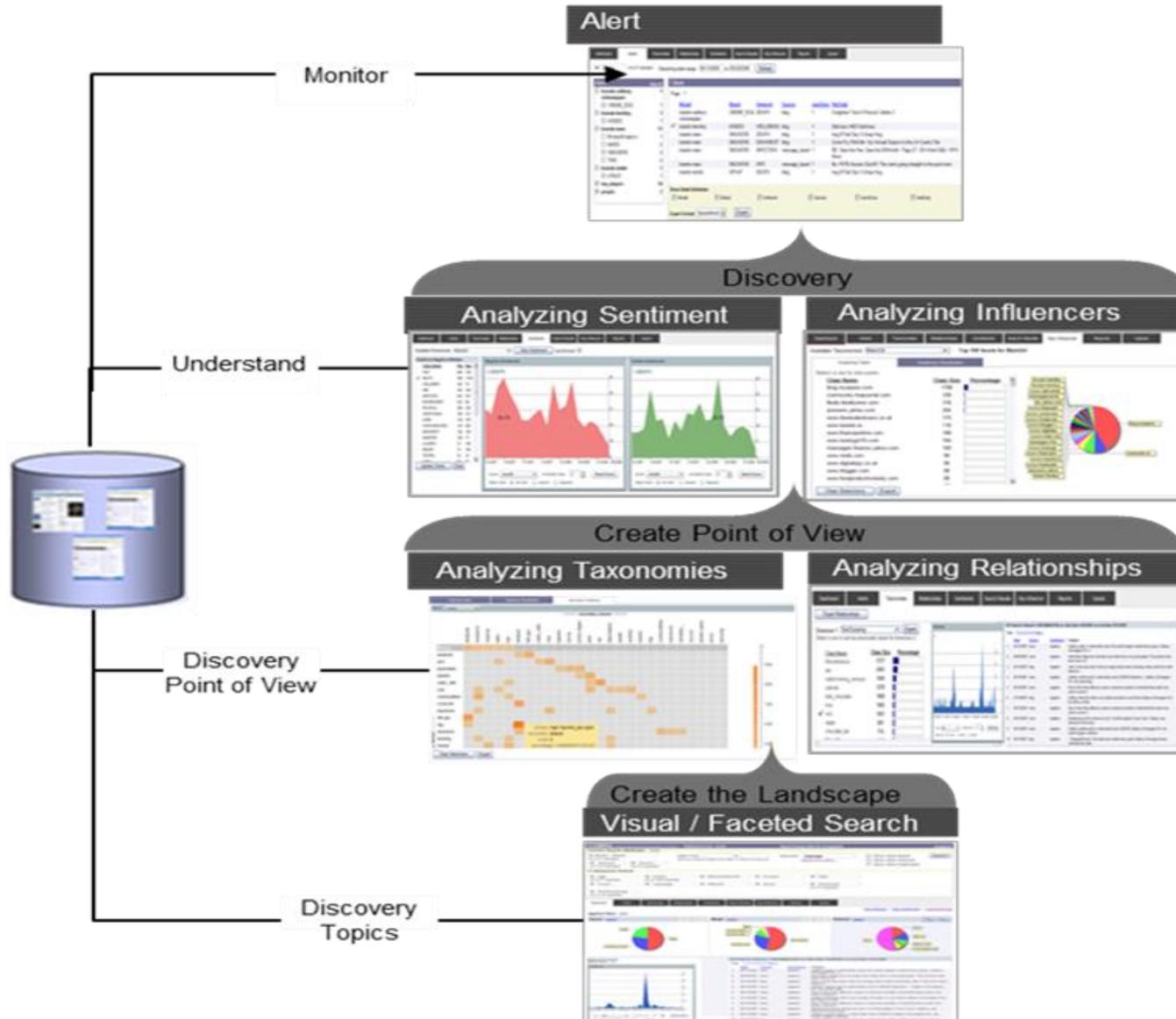
Based on the Brands and Issues …

- Snippets of information (chunks of text) about the company, its products, its people and its competition related to that taxonomy are captured based on the overall interests of management for implementing the system.

  - That information is analyzed based on a number of analytics, including "sentiment," "key influencers" and "co-occurring concepts."

Types of Information and Snippets

Taxonomy

- A taxonomy of "hot words" is built to facilitate capturing information for management's interests and concerns.
- For example, in the case of food, management was concerned with issues related to information about "choking," "allergy," and other issues as they related to the company and their competitors.
  - What can go wrong with Chocolate?

What Can Go Wrong with Chocolate?

Taxonomy of Critical Concepts

Sentiment

- Gathering sentiment from those snippets of text allows the firm to focus their efforts on issues that have generated either positive, neutral or negative attention.

- Sentiment about the firm, its brands and its people is tracked in social media, (i.e., Models) and ultimately compared to a range of variables, such as stock price to determine the impact of events on firm value.

Capture and Trend Sentiment

CADBURY-SCHWEPPES:negative in Blogs vs Total key-players in Blogs

negative:CADBURY-SCHWEPPES _____ ; Total _____
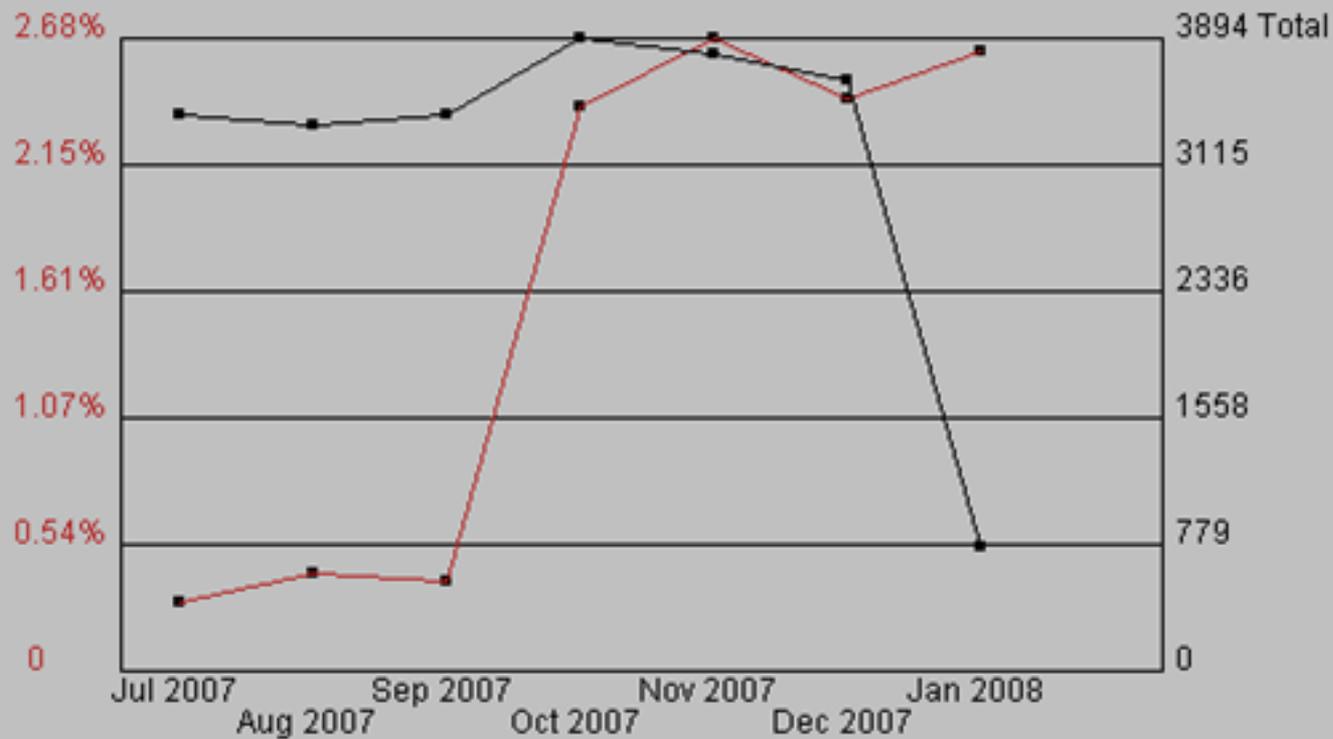
Analyze Co-Occurrence and Key Influencers

- Concepts that co-occur with key management concerns are captured.
  - "Emerging topics" (weak signals) of potential interest also are captured and reported to management (e.g., new products issued by the competition).
  - Finding "emerging topics" provides the firm with a glimpse as to what might be important issues in the future.
- Key influencers are determined and tracked (e.g., which news sources, blogs or Tweeters are most important).
  - Finding the key influencers provides the company with insight into who is driving the concerns and could lead to a better understanding of the rationale for the particular issues.

Co-table (Co-Located Concepts)

COBRA System | Alerts | Search | Reports | Cotable | Configure | Help | IBM

For: Brand ∨ <Swap>   Show top: Model ✓ Hotword   Brand   Datasource | Graph View

Brand	Pages	Hotword
Other	219809	27
KRAFT	102836	25
OREO	89200	25
chocolate	56382	27
✓ SNICKERS	44676	27
MILKA	18590	20
KITKAT	17497	23
TWIX	14925	24
OSCAR MAYER	12852	22
RITZ	11817	22
TOBLERONE	9554	23
MultiBrand	9301	26
HERSHEY	6834	25
CADBURY-SCHWEPPES	6327	25
REESE's	5332	23
KISSES	3437	22
MASTERFOODS	2380	24
CRUNCH	2265	19
MARS	2050	20
PHILADELPHIA CHEESE	1900	17
M&M's	1828	24
NESTLE	1129	18
IRENE ROSENFELD	1104	16
MILKYWAY	837	19
DAIRY MILK	713	20
SMARTIES	607	19
TODD STUZER	466	9

Top Hotword for Brand SNICKERS see docs   Export What is affinity?

High Affinity
✓ ALLERGY (451)

Medium Affinity

RENNET (387)	VEGETARIAN (339)	GMO (15)
LEGAL (120)	MARKETINGTOCHILD (10)	HEALTH (46)
OBESITY (217)	ENVIRONMENT (100)	DISHONEST (345)
SALMONELLA (18)	INFECTION (699)	DIABETES (88)
CHILDADVERTISING (40)	CONTAMINATION (192)	ROTTEN (14)
JUNKFOODTAX (2)	CHOKING (61)	

Low Affinity

POISON (174)	POLITICAL (494)	Price Fixing (10)
TESTING (133)	CRUELTY (86)	DEATH (1501)

No Affinity

HARM (440)   SAFETY (190)   Other (51741)

18

Most Influential Sites

Top 100 facets for MainUrl

Select a row to view posts.

Class Name

community.livejournal.com
feeds.feedburner.com
answers.yahoo.com
www.thestudentroom.co.uk
www.boards.ie
www.finanzaonline.com
www.lonelygirl15.com
messages.finance.yahoo.com
www.imdb.com
www.digitalspy.co.uk
www.blogger.com
www.foodproductiondaily.com

Top 100 facets for BaseCitation

Select a row to view posts.

Class Name	Class Size	Percentage
news.bbc.co.uk	167	
www.cadbury.co.uk	43	
www.hersheys.com	39	
www.cadburyschweppes.com	36	
www.masterfoodsconsumercare.co.ul	36	
getactive.peta.org	25	
www.myspace.com	24	
www.guardian.co.uk	21	
en.wikipedia.org	19	
news.bbc.co.uk news.bbc.co.uk	18	
www.marscandykills.com	18	
www.dailymail.co.uk	14	
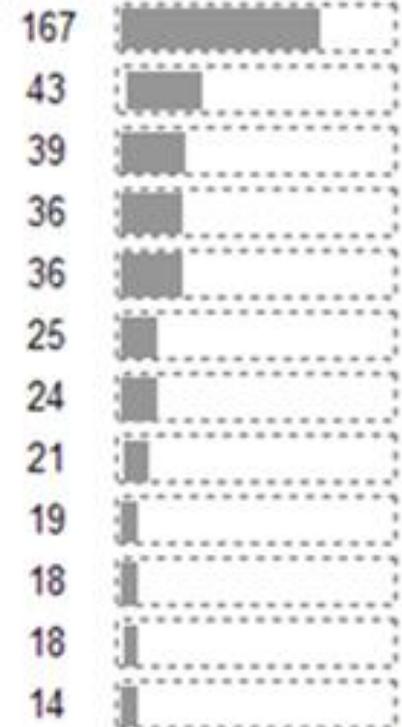
Reports – Dashboard
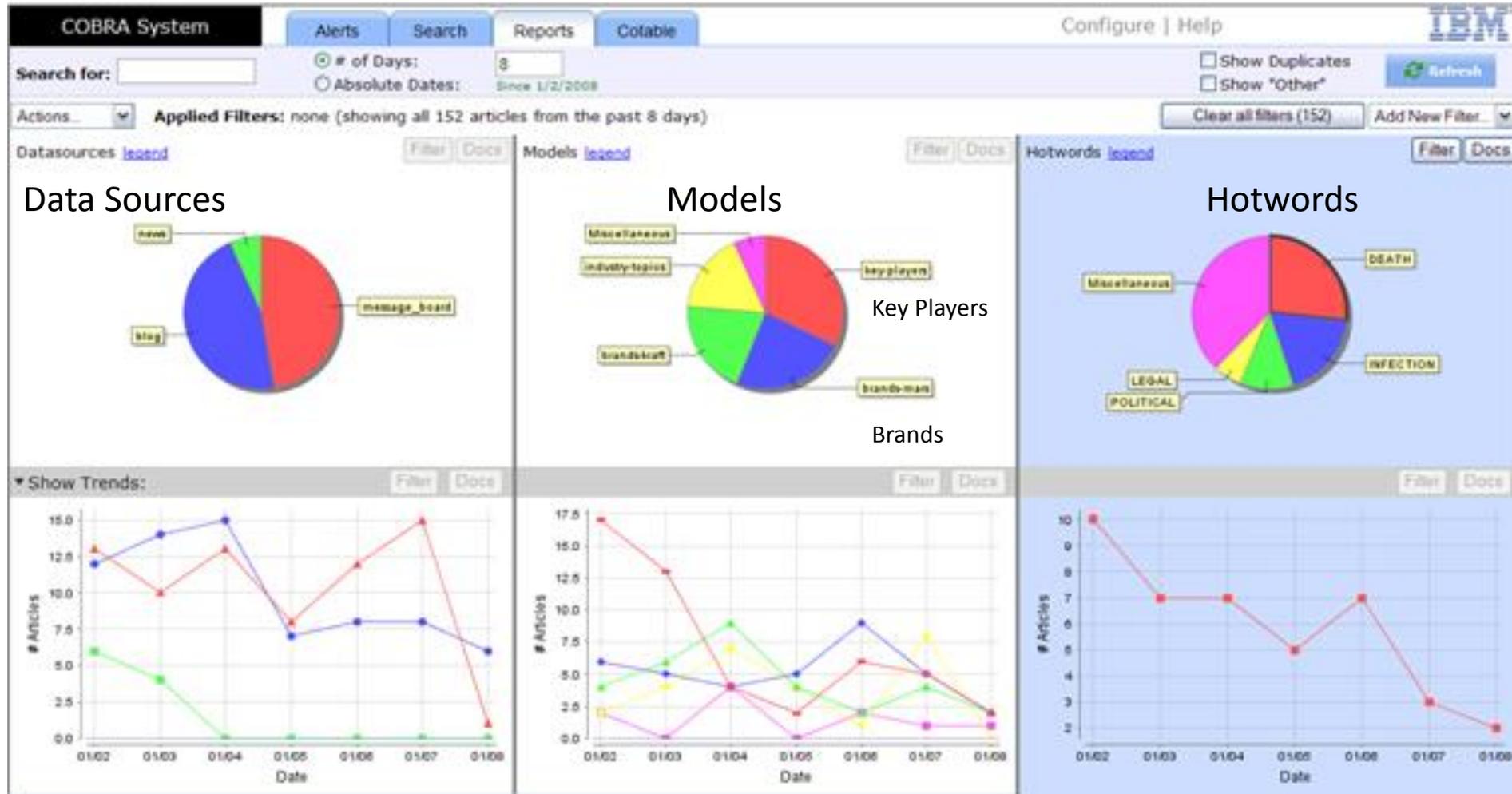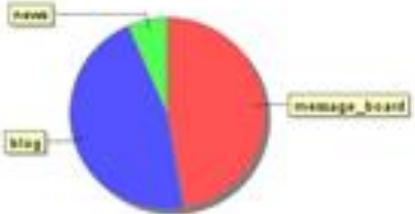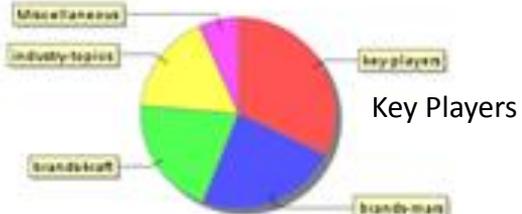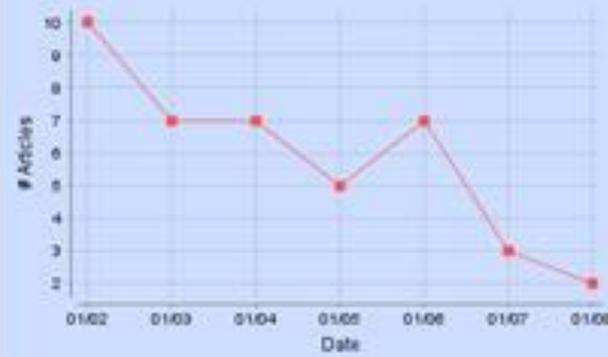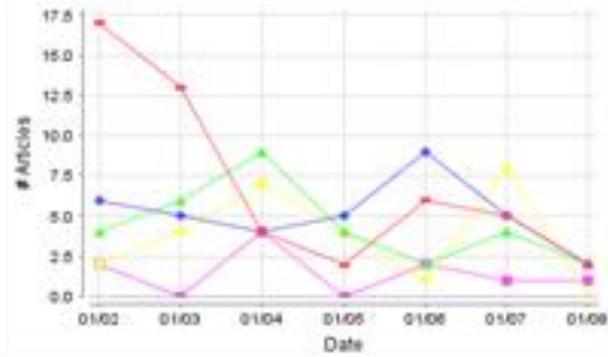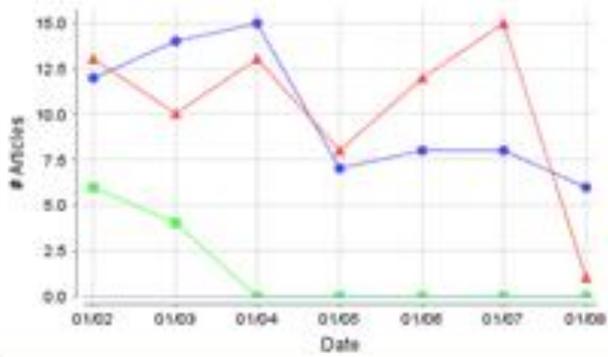
Significance of Application to the Business Units

- A wide range of corporate users are interested in the information and knowledge contained in social and other digital media.
    - The marketing department is concerned about the customer's view of different products.
    - The public relations department is interested in the public's view of brands and management.
    - Strategy is concerned about how the company's brands compare to the competition in the eyes of the customer.
    - Research and development seeks out product features the public is interested in and the reaction of the public to existing features.
    - Social responsibility is interested in the view that the public has about organization's overall environmental response and other issues.
    - Important information about all of these issues potentially could be found in different consumer blogs, twitter accounts and other digital sources, such as news sites.

Measurable Results

- The impact of COBRA has been substantial, with one estimate attributing a $50 million impact to COBRA.

- There have also been other non-dollar estimates as to the contribution of COBRA.

  - One company suggested that using the system they were able to increase the positive feedback by 1.0% and reduce the amount of negative feedback by 1.5%.

Challenges to Continuous Monitoring and Mining Digital Media

- "Biased" Signals
  - More likely to post negative
- Privacy
  - People and Key Players
  - Bring much information from "local" to "global"
- System Development and Configuration
  - Initially a development project
  - Need to involve management and domain knowledge
- Response Management
  - What happens when you "find" real information?
- Stand-Alone or Integrated System – CRM System Integration?
- The Strength of Weak Signals
  - Will the strong signals overwhelm the weak, but possibly important signals because of "counts"

Guidelines for Implementing Reputation Management Systems

- Choose Actionable Objectives
  - What are the key objectives of the system?
  - What are kinds of events that might occur that could jeopardize the company?
  - Which brands should the system be designed to monitor?
  - Who is the system is going to gather information about?
  - What sources of information do you want to search?
- Design Privacy Requirements into the System
  - Internal only? Should we investigate competitors?
- Relationship to Social Media
  - Determine responses to system findings: Active vs. Passive Response
- Manage both positive and negative
  - Information may appear negative, analyze for potential new products, etc.

Is this a Marketing Issue Only?

- KPMG has developed a system (<u>Astrus</u>) that uses continuous monitoring to facilitate "third party due diligence reporting and monitoring."

- PWC has developed a system designed for "continuous supply chain monitoring through advanced analytics."

  – Their system is based on information gathered similarly from the open web, the unindexed web, unstructured internal and external data, watch lists, and internal data. Ultimately, the system allows continuous monitoring of the full vendor network

Summary

- Social media volume, velocity and variety are substantial, and continuous …
- Reputation and other information is in there
    - Management, R&D, Marketing, Production, …
- A system is designed to capture that information
- Auditors can monitor clients
- Internal auditors can monitor a wide range of issues.
- *Challenges* include privacy, biased and weak signals, and what happens when you find X?
- *Guidelines*: Develop models, design privacy in, determine response capabilities

Questions?