Tap into the true value of analytics
Organize, analyze, and apply data to compete decisively
Preface
From the Editors’ Desk

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Today, 80% of business is carried out on unstructured data—documents, call center logs, blogs, wikis, tweets, and surveys. Neglecting to analyze such data leads to ignored risks, uninformed decisions, and missed opportunities. Financial services firms are increasingly analyzing unstructured data to understand customer needs, prevent frauds and expand the customer base. Analytics plays a key role in analyzing unstructured data and transforming it into actionable intelligence. The rapid adoption of social media by the financial services industry has resulted in an even higher percentage of unstructured data being generated. This has prompted firms to increasingly look at social analytics to derive structured insights out of social media. As unstructured and structured data analytics are converging, financial institutions are looking for analytic vendors to come up with products that blend unstructured analytics (like social analytics) with structured analytics (risk analytics). This article analyzes unstructured data, the various analytics vendors in the space, and applications in the financial services industry.

Unstructured data refers to data that does not exist in a database. Unstructured data can be textual or non-textual and takes the form of text, audio and images (refer to Figure 1 for more on the different sources of unstructured data). Unlike structured transaction data—which tells what customers did—unstructured data provides insights into why they did it, what else they want to do, and what problems they may have. The answers to these questions have significant business value. However, due to insufficient search techniques and inadequate technologies, businesses are usually not able to derive the right answers—leading to inappropriate decision-making.

Unstructured analytics help businesses analyze unstructured data and transform it into actionable insights. These primarily consist of text analytics, audio (or speech) analytics and video (or image) analytics. Social media analytics are an important form of text analytics making inroads.
Analysis of any form of unstructured data that helps transform it into actionable intelligence is called “Unstructured Data Analytics”. Structured data analytics uses business intelligence tools for querying and reporting, whereas unstructured data analytics utilizes text processing and keyword searches (to locate documents in servers). Unstructured analytics has evolved over time, moving towards next generation techniques like video and audio analytics (which are rarely used in the financial services industry) and text analytics (also known as text mining).

Text Analytics

Text analytics enable businesses to derive value from large quantities of text. This text can be available either in existing repositories or can be newly generated or acquired. This is done by extracting and interpreting relevant information to reveal patterns and relationships. Figure 2 elaborates the text analytics process in detail.

Text analytics is gaining importance in all industry segments (specifically the financial services industry), mainly because of the huge chunks of textual data being generated month after month by every organization (both within and outside the organization).

With the advent of Web 2.0 & 3.0, there is a greater emphasis on information-sharing
Text analytics process

<table>
<thead>
<tr>
<th>Information Retrieval</th>
<th>Transforming Text</th>
<th>Analytics</th>
<th>Reporting</th>
<th>Delivery</th>
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</thead>
<tbody>
<tr>
<td>• Collect and retrieve information from both internal &amp; external sources</td>
<td>• Content cleaning, removing duplicates, language recognition, etc.</td>
<td>• Selecting attributes, discovering patterns, interpreting &amp; analyzing the results</td>
<td>• Different mechanisms for notifying results, like dashboards, alerts, etc.</td>
<td>• Taking steps to augment existing data &amp; store enriched information</td>
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and user-collaboration using social networking sites. Interactions and posts on these sites play a huge role in shaping consumer sentiments about businesses, services, competition, and markets. Hence, corporations are investing in social media analytics tools that use text analytics to understand customer sentiments, and address them proactively.

Social Media Analytics

Social media analytics derive and measure key results from social media. Social media analytic tools use algorithms and approaches for automated analysis of blogs, chats, emails and other related social media. Key areas addressed by social media analytic tools are:

- **Finding the relevant blogs** - Identifying the relevant blogs and forums for a business
- **Detecting sentiment** - Detecting the sentiments expressed about a company, product or new launch
- **Measuring the influence and authority of key bloggers** - Identifying the key bloggers and how they are influencing the thought process of others on the web
- **Detecting topics of interest** masked in conversations on social network sites.

In recent months, a host of social media analytic products—from vendors such as IBM, SAS, Scout Labs, and Radian6—have hit the markets. These products will help banks and other financial services companies monitor and measure the performance of their social media campaigns—enabling banks to make informed decisions.

Key Vendors in Unstructured Data Analytics

The unstructured data analytics software market is relatively new, and the vendors in this space are still emerging and shaping their lines-of-businesses. SPSS (acquired by IBM) and SAS are the major players. There are a number of other vendors who specialize in offering text analytic—tools and tools for the monitoring and measurement of social media.

The Road Ahead for Vendors

The future lies in bridging the gap between structured and unstructured data and creating products that blend unstructured analytics with structured analytics. The challenge for vendors is creating structured data from unstructured information. The combination of various data sources and different types of data to drive business is
definitely worth exploring for vendors. The road ahead for vendors will be characterized by:

- **Integration of social media analytics with text analytics** - Vendors will be looking to integrate social media analytics with text analytics. In recent times, social media monitoring vendors have started to merge with text mining analytic vendors. Social media monitoring as a stand-alone capability of vendors will, thus, not stay for long.

- **Text analytics will be made available as a component of other applications** - Text analytics applications will move away from being siloed applications towards being a part or a component of other applications in the business. In such a set-up, insights derived from analysis of unstructured textual content will automatically flow on a real-time basis into the business for key decision-making.

- **Convergence of various types of analytics** - There will be a rapid growth of combinations of different types of analytics. For instance, text analytics with predictive analytics is expected to make rapid headway. Financial services firms will begin using a combination of text analytics and predictive analytics for risk management and fraud management on a large scale.

Applications of Unstructured Analytics in Banking, Financial Services and Insurance (BFSI)

Figure 3 highlights a few of the specific application areas within the BFSI segment where unstructured analytics can be readily deployed.

**Customer Relationship Management**

Customers share ideas, insights, experiences and perspectives about a company's services or products through social media. Most financial services firms still rely only on structured data analytics for customer intelligence. Unless these structured data analytics are blended with social media analytics, it is very difficult to achieve actionable customer intelligence.

**Stock Market Prediction**

Predicting stock market movements is a challenge for investors due to lack of consistent prediction methods. However, research shows that there is a strong relationship between news stories and stock price movements. Predicting the stock price movements based on news items is gaining increased importance in the text mining community.

**Fraud Detection**

Financial institutions lose millions of dollars to fraud every year. In banking, fraud arises as a result of stolen credit cards, forged checks, misleading accounting practices, etc. Financial services firms need to have improved analytical capabilities to reduce fraud levels and the associated costs.

A common thread in the above three application scenarios is a proper blend of structured analytics and various forms of unstructured analytics. A well-blended solution is much better than traditional analytics solutions.

A key challenge in using unstructured data analytics is that the unstructured data rarely has a consistent internal infrastructure, or metadata (unlike the structured data), and hence it is far more complex to analyze and model. Despite these difficulties, businesses are incorporating, and should continue to incorporate, unstructured analytics efficiently into their processes, mainly because of the extensive business value derived from such analysis.
Application areas of unstructured analytics

Figure 3

Customer Relationship Management
Fraud Detection
Stock Market Prediction

Improving customer experience in a bank using unstructured analytics

Scenario:
- A bank offered several services to customers through its online banking channel. Each typically involved multiple complex user interactions.
- Customers using these services felt that the website was not user friendly and they started moving to other banks based on that sentiment. They also started sharing negative sentiments about the bank in online forums.
- Many customers did not even have the patience to respond to the online customer survey feedback form.

Challenges Faced by the Bank

<table>
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<tr>
<th>Challenges Faced by the Bank</th>
<th>Solution Recommendation using Unstructured Analytics</th>
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<tbody>
<tr>
<td>• Lack of tools for achieving a 360° view of customers, resulting in poor customer retention rate.</td>
<td><strong>Optimum Solution: A blend of structured analytics using business intelligence tools and social media analytics.</strong></td>
</tr>
<tr>
<td>• Public relations disaster due to the negative sentiments expressed in online forums.</td>
<td>• The bank utilizes social media analytic tools to analyze online consumer forums and blogs. Along with this, the bank analyzes the Voice of Customer results collected from its own Business Intelligence (BI) tool.</td>
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<td></td>
<td>• This blended solution helps to accurately predict the customer sentiment and invest intelligently on customer experience management. This a shift from the traditional approach of only analyzing the Voice of Customer survey and Net Promoter Score, which would not have yielded the desired result.</td>
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Stock market prediction using unstructured analytics

Scenario:
- Stock market research is primarily based on two trading philosophies, namely, a) Fundamental - in which the prediction is based on the security's data—price to earnings ratios, return on equities, etc., and b) Technical - which uses charts and modeling techniques for prediction.
- Apart from fundamental and technical analyses, information from quarterly reports and breaking news also plays a major role in the movement of share price. Prediction has always been a challenge, since there has not been much success in analyzing this textual data.

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| Inaccurate stock market prediction when a breaking news story or quarterly results are declared, leading to huge losses for the brokers and investors. | **Optimum Solution:** A combination of Structured analytics (using technical approach) and Unstructured analytics (using fundamental approach).  
  - In a technical approach, the historical data of a stock is analyzed and a linear regression is run to determine the price trend.  
  - In a fundamental approach, article terms in financial news, shareholder's reports etc. are assigned a weight. Using the Bag of Words, Noun Phrasing & Named Entities techniques*, the textual key words that relate to “earnings” or “loss” are identified.  
  - The results of both the approaches are combined to arrive at a predictable outcome (up, down, or unchanged movement of the stock price).  
  - Refer Figure 4 for understanding the solution steps in a typical financial news analytical system. |

Financial news analytical system

![Diagram](image)

1. Fundamental Approach (Unstructured Analytics)
   - New Article
   - Textual Analytics Techniques like Bags of Words
   - DB

2. Technical Approach (Structured Analytics)
   - Regression Analysis
   - Stock Quotes

3. Stock Market Prediction Model

* These are specific approaches that use linguistic textual representations.
Detection of fraud in insurance companies using unstructured analytics

Scenario:

- Frauds in the insurance industry can occur in any stage of the transaction and can be committed by any party (i.e. new customers, policy holders, third party claimants or any other party involved in the transaction).
- Typical frauds include inflating actual claims, misrepresenting facts, and submitting claims for damages that never occurred.

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<th>Challenges Faced by Insurance Companies</th>
<th>Solution Recommendation using Unstructured Analytics</th>
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<tr>
<td>• Reactive approach for fraud detection whereby the insurance companies investigate only after a fraudulent claim is made.</td>
<td><strong>Optimum Solution:</strong> A combination of structured predictive analytics, speech analytics and social media analytics.</td>
</tr>
<tr>
<td>• Fraud investigation process is lengthy and expensive, as an investigative officer has to investigate personally to detect any suspicious activity in claims.</td>
<td>• Predictive modeling combined with text and social media analytics can be used to detect and prevent fraud.</td>
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<tr>
<td>• Limited fraud prevention mechanisms.</td>
<td>• Inputs to the predictive model are from internal &amp; external watch lists of criminals who previously engaged in fraud, diagnostic fraud indicators based on surveys taken by the claim handlers, anomaly patterns, profile details of individuals, etc.</td>
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- The results of the predictive model combined with the result of claimant's speech analytics (to detect whether the claimant is lying or not) along with the results of social media analytics (to detect the relationship among the policy holders) can be used to generate a risk score of the claimant.
- This risk score can then be used to detect fraud customers even before issuing the policy.

Conclusion

There is an increasing requirement within organizations to inquire and analyze across structured and unstructured data. Integrating unstructured data with structured data is quite a challenge. Despite the challenges, many analytics vendors are coming up with solutions to integrate structured analytics with unstructured analytics. By converging unstructured analytics into the structured analytics mix, businesses are seeing substantial improvements in the accuracy and relevance of their analytic initiatives. Incorporating analytics blends into business processes is a growing trend; however, they must be correctly applied to a specific business scenario, and companies
must act on the results appropriately. The convergence of unstructured analytics with structured analytics is no longer an “if”, but rather a “when”. 
About FICO

FICO (NYSE:FICO) gives businesses an analytic advantage by using powerful predictions of consumer behavior to drive smarter decisions. Clients in 80 countries work with FICO to increase customer loyalty and profitability, cut fraud losses, manage credit risk, meet increasing regulatory and competitive demands, and rapidly build market share. FICO also helps millions of individuals manage their credit health through the www.myFICO.com website. FICO. Make every decision count.