EVALUESERVE
YOUR GLOBAL KNOWLEDGE PARTNER

How to Make the Data Elephant Dance?

Does it matter if you give a "thumbs down" to a product on a webpage? Can a nameless reviewer impact a company's strategy? Evalueserve discusses Big Data Science and the tools that can convert gigabytes and petabytes of social media data into business insights.

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Executive Summary

Advances in information technology, stringent regulatory frameworks, and the widespread adoption of social media over the last 10 years have created several problems and opportunities for executives in various industries. One such problem is obviously the need to store and analyze the ever-increasing amounts of data that comes in different forms, shapes, and sizes. Another is the need among business leaders to derive insights from internal and external data, so as to improve their firm's Time, Quality, Money, Risk, Compliance, and Experience (T, Q, M, C, R, E) metrics.

The sheer volume and variety of data, especially that generated by social media, has led to the growing influence of a new field called Big Data Science. Also, recent advances in computing and a rapid decline in data storage and processing costs have led to the emergence of techniques that can help the user in deriving real-time insights for marketing, product design, risk management, and compliance. According to Evalueserve, although improved technology and tools will play an important role in improving efficiency with respect to the T, Q, M, C, R, E parameters, they are likely to act only as decision support systems because of their inherent limitation with respect to contextual understanding. Human subject matter experts would be required to ensure that problems are solved in a more robust and effective manner.

Recognizing these trends, Evalueserve is developing solutions in many fields using Big Data Science as well as the insights of numerous subject matter experts. We call this the "human+machine" engagement model. These solutions are being developed in areas of marketing, risk, and compliance, where data from the internet in the form of blogs, news articles, etc., is utilized to create solutions. These solutions include social media monitoring for tracking customer views, signs of supply chain disruptions, or credit defaults. For example, Evalueserve's social media monitoring solution for marketing uses technology to process data and track variables for important KPIs such as customer experience. Evalueserve's marketing analysts use this information to recommend areas of focus for advertising on social media.

We are also actively engaged, with our clients, in improving existing processes by using our "Innovation Lab." An example of a solution that will emerge from our Innovation Lab by January 1, 2014, is a customized database that tracks the movement of approximately 2 million C-level executives in about 75,000 companies worldwide.

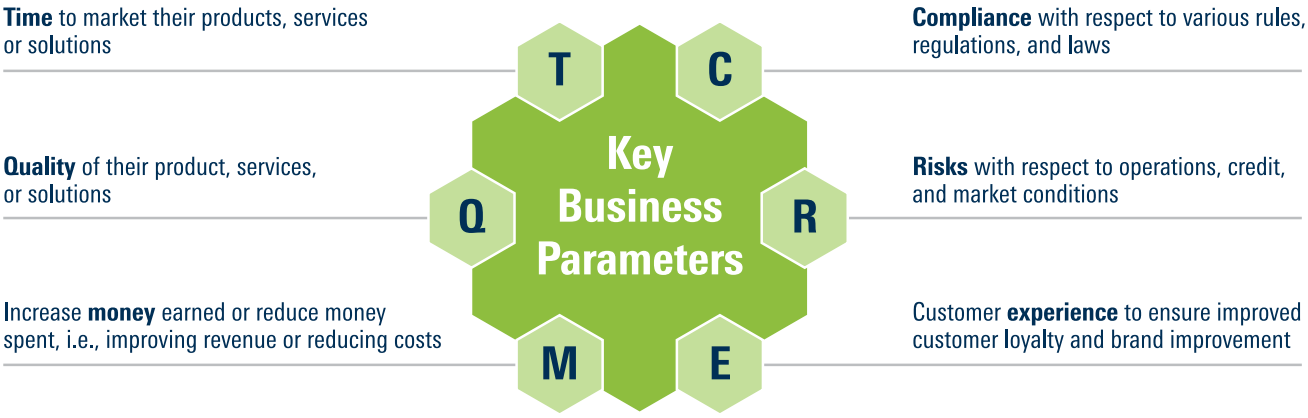
One Man's is Another Man's Business

Does it matter if we give a "thumbs down" to a product on Facebook? Can a single Facebook user change how a company thinks about its products? The answer is probably both "yes" and "no". "No" because companies have not yet figured out as to how to get their arms around the enormous amounts of data in the form "likes","dislikes", and topics. "Yes" because Big Data Science is evolving rapidly and companies such as Evalueserve are working on developing tools and solutions to convert gigabytes and petabytes of social media data (thumbs down, likes /dislikes) into information and then into business insights.

Data-driven Business Management Strategies Create Powerful Differentiators

Data Analytics – Mining Insight to Augment Business

Businesses – Big, Medium, and Small – are all interested in getting insight from data (be it Big Data or Small Data) to improve one or more of the following parameters:



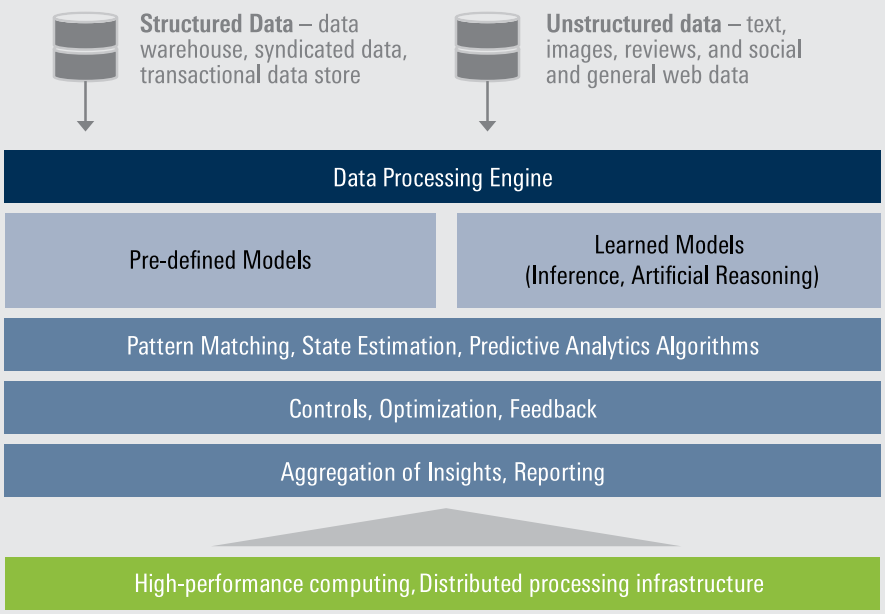
Improve **T, Q, M, C, R,** and **E** – Analyze and Gain Insight

Source: Evalueserve Big Data Science

To improve its T, Q, M, C, R, E metrics, a firm needs to **Analyze and Gain Insight** by incorporating the following disparate data – market research data, syndicated research data, demographic data, economic data, internal and external transaction data, cell-phone data, call center data, machine data, social media data, and ERP and CRM data.

Big Data Science helps organizations in achieving their target of gaining insights for the purpose of improving their T, Q, M, C, R, E metrics. Evalueserve has been offering classical data solutions for several years. During the last 18 months, it has invested in a Big Data Science Platform and an Innovation Laboratory, which it is leveraging along with its cross-functional and subject matter expertise, to build solutions in marketing, risk and compliance, and supply chain management.

Evalueserve's Big Data Science Innovation Lab



Key Features

- Extensive library of machine learning, statistical and artificial intelligence algorithms, including popular open source packages and custom developed algorithms
- Extensive library of industry vertical specific mathematical models to solve most data analytics problems in marketing and ecommerce
- Handle any type of datasets – large, sparse, missing, noisy, and high-dimensional
- Real-time analysis and integration of insights with enterprise tools to support ongoing business functions (e.g., ecommerce)

Use of Big Data Science in Risk and Compliance

The demanding regulatory frameworks that evolved after the 9/11 terrorist attacks and the financial crisis of 2008 have made the issue of risk and compliance ever more critical, especially for financial services firms. Separately, social media has increased the risk of information leakage and non-compliant communication, while simultaneously opening up opportunities for monitoring customer experience and credit or operational risk. This has led to a massive increase in the cost of maintaining large compliance and risk management teams, as well as an intense need to integrate risk and compliance with business strategy to drive profits and growth.

Indeed, Evalueserve is supporting some of the largest global banks in developing risk measurement models for credit, market, and operational risks under Basel guidelines for determining bank capital. We have industry experts with advanced academic degrees in the fields of risk management, math, statistics, economics, computer science, and finance, who are engaged in developing, validating, and documenting these models.

We are also leveraging Big Data Science to develop tools for risk monitoring, which can help a firm implement timely action to reduce losses caused by extreme external events (also referred to as Black Swan Events). For example, Evalueserve's risk experts believe that there was sufficient information on social media and other websites about impending defaults by various trade counterparties that led to the financial crash in 2008. However, there were no tools available at that time to cleanse and synthesize this large and constantly changing information. Evalueserve is currently developing tools that will "scrape" information from social media websites, news articles, blogs, and other parts of the internet to provide real-time risk monitoring of information on the credit risk of various trade counterparties, and with respect to supply chain disruptions.

Similarly, for procurement departments of our clients, we have identified a need to monitor the real-time risk of suppliers, countries, and categories, based on spikes in news articles and sentiment on the internet (including on social media websites and blogs). For example, the 2011 earthquake and the tsunami in Japan did not directly impact the production of car makers such as Toyota and Honda. Instead, the ensuing closure of the Fukushima Daiichi nuclear power plant and the consequent energy shortage and transportation disruptions had an impact on auto-component manufacturers, which indirectly brought

automobile production to a halt not just in Japan but also in North America. Evalueserve's analysis shows that the potential impact of the tsunami in Japan and the resultant losses could have been reduced substantially if appropriate tools had been used to understand the topics and themes being discussed on various websites and blogs.

Social media is also becoming an important tool for customer engagement, but with the associated risks of non-compliant marketing. In this context, the Securities Exchange Commission (SEC) in the United States has recently promulgated rules for marketing communication through social media, which apply to financial advisors working for wealth management firms. Under these rules, wealth management firms are required to monitor and supervise communication on social media to ensure that their financial advisors follow the same guidelines as applicable to traditional means of communication and advertising.

Evalueserve is developing social media monitoring tools for compliance that can help firms supervise such social media communication. These solutions are being implemented using a "human + machine" model that uses Big Data Science solutions to undertake text extraction and morphology on the basis of compliance corpora, follow it with topic modeling to flag potentially non-compliant communication, and then a final review by human experts (in order to reduce false positives) who submit a regular report to internal compliance teams.

Use of Big Data Science in Marketing

Marketing Science is evolving rapidly, as social media creates an opportunity for firms to "peek into the end-customer's mind", and as advances in Big Data technology enable instantaneous insights for marketing budget optimization. It is therefore not surprising that Evalueserve is leveraging its classical analytics and Big Data Science expertise to empower firms with respect to marketing and customer management. Our marketing science solutions include the following:

1. **Social Media Monitoring** tool carries out sentiment monitoring and analysis based on unstructured and structured data from social channels and other sources of customer information in English and Spanish. By creating and linking topics and themes, it enables the discovery and optimization of primary growth levers on Facebook, Google Plus, Pinterest, Instagram, and Twitter.

2. **Digital Attribution** provides real-time attribution and actionable insights with respect to marketing spend on various channels. This solution also provides cross-channel advantages and synergistic effects of all the marketing channels.

3. **Media Mix Optimization** enables marketing-mix modelling and an analysis based on digital and offline channels, distribution channels, and other non-marketing factors. We provide marketing-mix recommendations for optimal business outcomes – return on investment (ROI), customer life-time value (CLTV), customer acquisition, and other business metrics, such as brand portfolio optimization.

In Evalueserve's experience, HUMAN or FTE-only solutions are four times more costly than "HUMAN+MACHINE" solutions for social media sentiment analysis.

4. **Promotion Effectiveness** allows promotions planning and analytics, demand forecasting as well as price elasticity analysis. It also helps in the optimization of promotions mix across product categories at the channel, market, and store levels. Finally, it helps estimate cross-attribution of promotions and advertising on sales lift and brand equity.

5. **Customer Analytics** involves consumer segmentation, personalization, and targeting based on multi-channel marketing, commerce, and CRM data. It includes customer response modelling for specific target outcome, including improving wallet share, retention and churn, and loyalty program optimization.

6. **Performance Analytics** involves performance monitoring and tracking of retail store operations based on data from point-of-sale systems, procurement, sales channels, and product inventory. It incorporates customer analytics from social channels and word-of-mouth reviews to enhance performance analytics for specific customer segments.

Future of Big Data Science

Evalueserve believes that organizations worldwide will need Big Data Scientist Groups that consist of subject matter experts as well as people skilled in math, statistics, or computer science. Indeed, solution providers such as Evalueserve, which possess the requisite domain expertise as well as math and computer science skills, will become true partners for businesses, and will help them in solving their problems and in identifying new issues.

1. **Technology will play an important role in Big Data Science.** Whether it is classical analytics or Big Data Science, tools that utilize the service providers' domain expertise and the latest technology will become ever more critical. While the enormous volume and variety of data makes the use of technology essential, the possibility of technology enabling previously unimagined analysis will make businesses push for it aggressively.
2. **There will be an increase in the use of machine learning algorithms to reduce the amount of human effort required.** Classical analytics requires analysts to have sufficient understanding of the data to create a hypothesis and to verify it using statistical techniques, e.g., Bayesian classification and analysis. Artificial Intelligence algorithms in computer science were developed in the 1980s, and have been improving ever since. With distributed computing, they can now be used to solve real-life problems rather than in just universities and laboratories of large Information Technology companies.
3. **"Human+Machine" models will emerge to deliver truly meaningful analytics.** While tools will be essential, we at Evalueserve do not believe that tools alone can entirely solve client problems. In fact, subject matter experts will need to be involved to provide the contextual information and knowledge missing from mechanical output. In addition, some analysis has to be carried out by humans, because the data could be erroneous or dirty.

CXO-Link: A Tool from Evalueserve's Innovation Laboratory

Evalueserve has recognized the above-mentioned emerging trends, and is investing heavily in innovation, especially in the field of Big Data (including the field of artificial intelligence). Indeed, we are actively engaged with our clients in improving existing processes by using our "Innovation Lab."

An example of a solution that will emerge from our Innovation Lab by January 1, 2014, is a customized database that tracks the movement of approximately 2 million C-level executives in approximately 75,000 companies worldwide. This database will provide support to marketing, investment banking, and wealth management teams of financial services, professional services, and law firms. This tool and the corresponding database will track second- and third-degree connections of such C-level executives and board members to help clients answer the following questions:

1. Do any of the partners at a law firm (the client) have a direct relationship with a particular company?
2. If there is no such direct relationship, is there a second-degree connection? In other words, does someone at the client location know a C-level executive or a board member at this company through a mutual C-level executive or a board member?

While creating this database and the underlying tool – and for its regular update – our Innovtion Lab uses a Hadoop cluster and NOSQL databases for internet crawling and information extraction and various real-time algorithms for text processing and relationship construction.

About Evalueserve

Evalueserve is a global specialist in knowledge processes with a team of more than 2,600 professionals worldwide. As a trusted partner, Evalueserve analyzes, improves and executes knowledge-intensive processes and leverages its proprietary technology to increase efficiency and effectiveness. We have dedicated on-site teams and scalable global knowledge centers in Chile, China, India, Romania and UAE, which provide multi-time zone and multi-lingual services.

Evalueserve's knowledge solutions include customized research and analytics services for leading-edge companies worldwide. By partnering with us, clients benefit from higher productivity, improved quality, and freed-up management time. We provide our clients with better access to knowledge and information across all parts of their organization, thereby adding to their capabilities.

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