

# The Changing World of Big Data

And How to Profit from It



**B**ig Data has always been, by definition, massive. But with constantly increasing numbers of smart connected devices, more and more sensors in machines, and the continuing spread of information technologies worldwide, even that definition no longer does it justice.

In 2011 alone, for example, estimates are that the world collectively created 1.8 Trillion GB of new information; this is expected to multiply many times by 2016<sup>1</sup>. To cite other examples, Twitter recently announced that it processes over 350 billion tweets every day<sup>2</sup>, while Facebook sees over 250 million photos and over 2.7 billion “likes” and comments each day<sup>3</sup>.

But today, Big Data is no longer simply about size. Putting it to productive use has gone beyond simply storing it. Indeed, to make the most of Big Data the question to ask is no longer, “Where do we put it?” but rather, “How do we use it?”

### It’s Not Just Volume Anymore

When dealing with Big Data was all about storing it, the Big Data concerned was mostly highly structured – customer transactions, supply chain information, human resources records, and the like. Today, however, the explosion in information is being driven by external data flows that are primarily unstructured. They come in a wide variety of forms and the valuable parts of the information they contain frequently have a brief shelf life, making them a poor match for the data systems and tools that most organizations presently rely on.

The real value in both structured and unstructured data is the information within it that provides deep insight about markets, customers, and prospects — insight that enables companies and marketers to more accurately predict behaviors and outcomes, and to shape their plans and actions accordingly. It is

these predictive “Signals,” hidden in the “noise” of the rest of the data, in which the value actually resides.

And the more refined and specific the Signal, the more valuable it is – even within a specific company. Within a particular bank, for example, a Signal that helps predict fraud is much different from a Signal that helps identify customer willingness to pay for a mortgage.

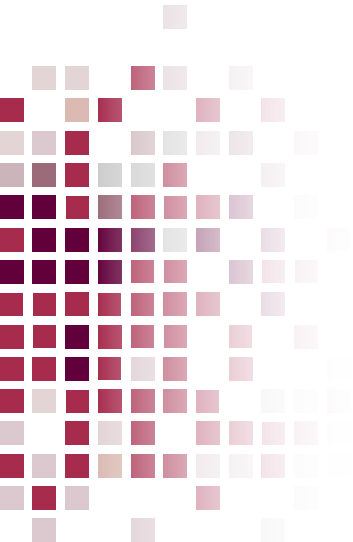
This ability to identify powerfully predictive and descriptive Signals in data, through the use of advanced techniques and sophisticated algorithms, is critical to activities such as segmentation, granting credit, maintaining and growing customer relationships, monitoring supply chain, and gauging workforce sentiments.

For instance, a Casino experiencing customer churn of more than 25% wanted to identify the Signals indicating which players were most likely to attrite. It started out by identifying behaviors which were likely to result in attrition. It then determined if each of these behaviors had statistically significant causal or predictive effect on customer churn. The result was identifying a combination of fading Signals, such as rapidly declining gaming spend, which were the strongest early predictors of attrition<sup>4</sup>.

This is, of course, a complex process, one that requires highly advanced algorithms and other analytic techniques, as well as massively parallel computing and machine learning capabilities<sup>5</sup>.

But while Big Data analytics necessarily involves complex computational models and statistical tools, it is critical that we do not overlook the need for human intelligence in arriving at data-driven and logical decisions.

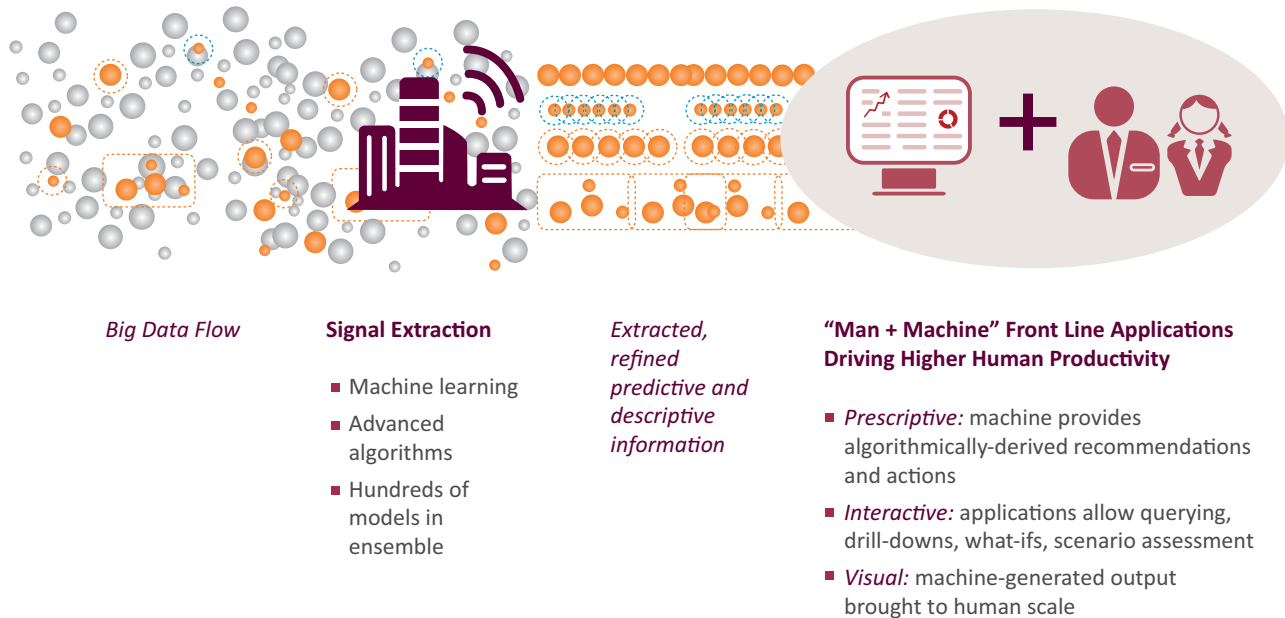
*“Understanding is no more limited by data paucity, but by the challenge of making sense of the data deluge”*



## The Human Element

Big Data analytics is all about leveraging machine learning to allow for the application of human insight (See Figure 1). That's why humans plus machines, and not humans vs. machines, is the new paradigm for successful organizations in the Big Data era.

**Figure 1: Capturing the Value of Big Data Through Advanced Analytics and “Man + Machine” Applications**



Source: Capgemini Consulting and Opera Solutions

Today's massive flow of Big Data overwhelms humans' ability to interpret it. Machines, armed with vast computing power and advanced algorithms, are far better at finding hidden patterns and extracting predictive information from raw data. However, machines lack the ability to consider orthogonal factors, and the creativity to consider what could be. The human ability to think abstractly and creatively, to bring in new ideas, to apply

opportunities and possibilities, when paired with machines' abilities to process huge amounts of data flows and bring to light hidden patterns and connections that elude human understanding, make the machine plus man combination unbeatable.

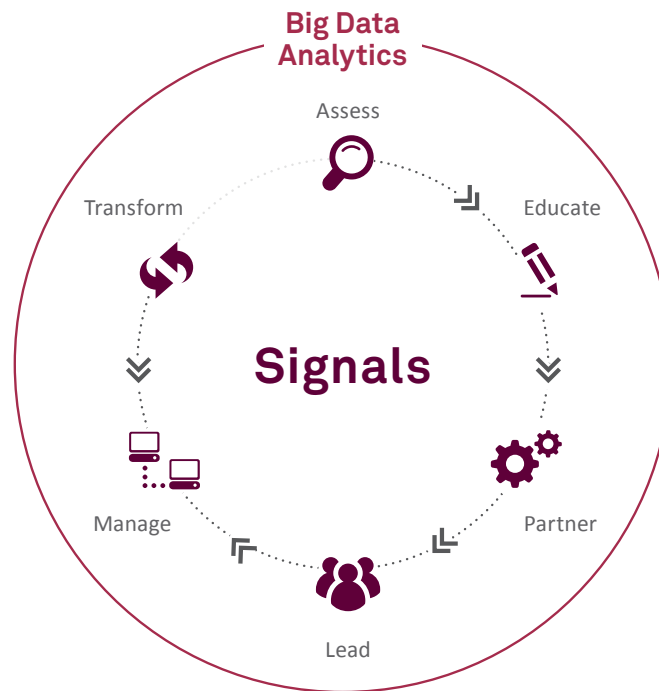
For instance, at a leading global auto manufacturer, machine learning helped sales representatives at live auctions

time. The sales representatives leverage the recommendations of the machine learning model, and their observations at the auction, to determine optimal floor pricing. This approach has resulted in more than \$30MM increase in estimated profits per year<sup>6</sup>.

## Putting Big Data to Work for You

Benefits of Big Data analytics can in some cases be blindingly obvious, and in others, be highly elusive. In both cases, however, it is imperative that organizations follow a structured approach towards harnessing its latent power and value (see Figure 2).

Figure 2: Putting Big Data to Work



Source: Capgemini Consulting and Opera Solutions

“Benefits of Big Data analytics can in some cases be blindingly obvious, and in others, highly elusive”

### Assess Current Standing

A critical first step is to examine the organization's current standing with respect to data management and to Big Data in particular. Key questions typically involve identifying the extent that an organization is leveraging the number of data sources available to it; the importance of human judgment in its processes; and the Signals that can be algorithmically definable. Companies should be willing to challenge long-held assumptions about how effectively

they use their data. They should look at industry best practices to understand how successful data-driven companies work and what separates them from the rest. Only then can they ask the right questions and identify the right metrics to evaluate.

### Educate Staff

Accepting Big Data analytics requires understanding what it is, how it differs from current data management, and the potential it has to provide valuable insight

and competitive advantage. Successful management of Big Data calls for new skills and competencies at almost every level, beginning with the CIO. These may be acquired through a combination of training and recruiting; however, staffing is likely to be a challenge in the near term due to a limited supply of knowledgeable talent.

## Partner to Win

Because most external data is highly ephemeral and embedded in ongoing data streams, accessing it will generally require partnering with a variety of sources. For instance, organizations looking to understand public perception of their brand should consider partnering with social networks such as Twitter to have access to the veritable firehose of tweets either globally or in a region. Partners with Big Data expertise and capabilities will also be important for many organizations. Tesco's ClubCard, for example, is the most popular loyalty card scheme in the UK. The company collects a significant amount of data from its customers and has worked with data analytics company Dunnhumby to understand them better. The results have been so compelling that Tesco, while growing to be the UK's top retailer, eventually acquired a majority stake in the analytics company. Tesco is estimated to have saved over £350MM a year since they joined forces<sup>7</sup>.

## Lead from the Front

Because of the fundamental changes required in culture, people, processes, and technology, analytical transformation of organizations should be driven by top management. Amazon's focus on data, to cite one significant and successful example, is driven right from the top by their CEO, Jeff Bezos. Similarly, at social gaming site Zynga, CEO Mark Pincus focuses on a variety of metrics, including traffic and customer satisfaction. Differing definitions of what analytics really is and what it covers, a lack of single accountability for analytics within corporations, and the absence of sufficient analytical and managerial skills to make sense of the data all make involvement by top leadership even more critical.

## Manage the Change

Change management initiatives should be implemented by businesses not only to deal with resistance but also to embed analytics deep into the organizational DNA. Moreover, the transition from an intuition-based to a fact-based culture will entail several strategic and operational changes for the workforce that need to be tactfully managed.

## Transform for the Future

Building a sound governance model that ensures implementation is on the right track, upgrading legacy systems to be ready for the future, and adopting new delivery solutions all help prepare an organization for a future where Big Data holds the keys to value. Organizations will need to evaluate the governance model that works best for them. For instance, while there are merits to both centralized and decentralized analytics operating models, the choice and implementation of a specific model has to be closely tied to the current organizational culture. It should also be borne in mind that a successful transformation can only be achieved when all elements critical to it are working together.

In conclusion, analytics is a critical element of the digital transformation challenge that is now facing companies across sectors. Getting it right should be an organization's highest priority. That won't happen overnight. Companies will have to create greater acceptance of a data-driven approach, one in which employees do not shy away from using data to prove their points. Organizations should also encourage widespread use of analytics techniques, including predictive modeling and optimization, and encourage senior management to be at the fore-front in doing so.

Organizations now have the capability to find and extract the Signals from Big Data that give their leaders new understanding into their markets and a powerful competitive edge. By combining scientific thinking of the highest order with today's most advanced computing technologies, it is possible and affordable to acquire business intelligence that until now was beyond the reach of all. In order to help executives take advantage of this important aspect of their digital transformation, there is therefore a need to reframe the analytics challenge by understanding and addressing the Big Data opportunity in the specific context of the current digital economy.

**“Analytical transformation of organizations should be driven by the top-management given the fundamental changes required in culture, people, processes, and technology”**

### Sources

- 1 ZDNet, "Data volume to hit 1.8ZB in 2011", Jun 2011
- 2 Company tweet
- 3 Company IPO Prospectus
- 4 Client experience
- 5 Machine learning is a scientific discipline concerned with the design and development of algorithms that allow computers to evolve behaviors based on empirical data, such as from sensor data or databases
- 6 Client Experience
- 7 Independent, "Cashing in, the couple who dreamed up Tesco Clubcard", Aug 2010

## Contacts

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### Capgemini Consulting

**Ingo Finck**

ingo.finck@capgemini.com

**David Ketchins**

david.ketchins@capgemini.com

### Opera Solutions

**Laura Teller**

lteller@operasolutions.com

**Guillaume Lamothe**

glamothe@operasolutions.com

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