

CIO BRIEF 2.0

Big Data and Data Analytics

(Volume 18, Number 3)

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Introduction

At a time when organizations are just beginning to do the hard work of standardizing and integrating their internal data, “big data”, that is extremely large data sets of structured and unstructured data from a variety of sources, is looming on the horizon. Today, tools and techniques are becoming available to store, manipulate, analyze and manage these very large data sets to gain new insights into customers, supply chains, and business and environmental conditions and use them to deliver value to an organization. In order to learn how big data will affect IT and how it presents information to the business, The CIO Brief invited Robert Lanoue and Shreeshant Dabir of Deloitte to discuss what CIOs need to understand about big data.

The Evolution of Analytics

Robert Lanoue leads Deloitte’s Canadian Marketing Strategy Practice and specializes in the areas of customer analytics, customer experience and transformation to customer-centric organizations. “Use of big data for analytics is a huge topic with many domains, such as customers, supply chain, workforce, and risk,” he explained. Ideally, it will enable companies to combine data from disparate sources and use analytics to create actionable insights that will enhance strategic, operational, and tactical decision-making.

In addition to data, technology, processes and controls, and talent are all required for a mature analytics function. “I see great models in the business these days, but what’s important is what companies are doing with the data they collect and how they are structured to leverage insights,” Rob said. Increasingly, companies are demanding more and better information to meet their needs and to obtain it, companies need a data strategy, sophisticated business users and statistical experts, and the technology to capture and manage data and to apply key analytical techniques, such as manipulation, algorithms, and visualization.

The analytics capabilities needed for business range from simple operational reporting using standardized static reports, to KPI reporting, visual data exploration, segmentation of customers and products, and ultimately to simulation and optimization. “Although tools are necessary for analytics,

this is not a tools challenge,” said Rob. “Instead, companies should focus on what analytics can mean to the business and develop the processes, capabilities, data and timelines to make the tools effective.”

The value delivered through analytics increases as tools and methods become more mature and integrated across the entire value chain. Early analytics were based on historic, siloed internal data and rudimentary techniques. Decisions were based on a mix of limited data insights and intuition. More mature analytics use frequently refreshed internal and external data and more complex analytical techniques. These then enable rapid decisions based on robust insights. Tools and methods are often embedded in the workflow of companies but the analytics themselves are still primarily based on siloed, structured data within each business function. Emerging analytics are based on real-time, structured and unstructured data sets and statistics-driven techniques. They enable real-time decisions supported by multi-layered insights from multiple business functions. “Most companies today are between early and mature,” said Rob, “but the field is moving rapidly. Much of what is ‘emerging’ today will be mainstream in two years so it’s important for companies to be ready for this next analytics wave. Learning how to think about data, developing more discipline about collecting data, experimenting with analytics models, and changing corporate culture to enable some risk as models evolve are critical new capabilities.”

Analytics must start with relevant business questions that address key value levers, such as: *What are my biggest drivers of profits? Or, How can we reduce the downtime associated with equipment failures?* Then, relevant lagging, leading and predictive indicators can be developed based on key data domains. In one organization, Rob noted that both qualitative and quantitative data were used by its planners. However, merely acquiring lots of data is not a solution, nor is simply plugging in a model. “It’s important to identify the right person to work with the business,” he explained, noting that all models are wrong to some extent but some are useful and the right person is needed to know how to interpret insights and adjust models.

Organizations are not looking for analytics in and of themselves but for insights into key business questions. “Demand for analytics spans many different functions in an organization,” Rob stated. “However, deep insights cannot be developed without the right foundational infrastructure however.” Getting the infrastructure right means asking questions, such as:

- How can we attract, grow and retain key employees?
- What is the optimal way to collect and manage the massive amounts of structured and unstructured data needed?
- How can we best support varied and dynamic business needs more rapidly?

Once this infrastructure has been developed, the business will become increasingly interested in using it to address their questions and to cope with the challenges they are facing on many fronts.

Big data is both a solution and a source of pressure for organizations. For example, Amazon and Google are constantly raising the bar for other companies with their use of big data and setting higher customer expectations for everyone as a result. Pressure on companies comes from three sources:

- **Increased competition** that is creating demands for ever-more insights to sustain and grow competitive advantage.
- **Increased complexity** that is creating demands to continually improve performance and find clarity in an environment of uncertainty.
- **Growing constraints** that are making some activities and operations more difficult to manage and control.

However, while these pressures are challenging for companies, the research shows that addressing them with improved analytics are increasingly driving better decisions and higher value at all levels – strategic, operational, and tactical.

Big Data Analytics

Shreeshant Dabir is a Senior Manager in Deloitte's Information Management Practice and leads its Big Data practice in Canada. He is also a thought leader in the development of advanced analytic solutions for structured and unstructured data using a variety new and traditional data technologies. "Big data is happening now," he explained. For example, mainstream companies such as Sears are already using it to compare its prices to those of other retailers and to dynamically adjust them to remain competitive. Sears is also moving to open source data storage using Hadoop. "Big data helps companies do the same types of analytics on their data as they've always done and more, but without

the constraints of traditional data warehouses,” Shreeshant explained. “Data warehouses were band aid solutions. With big data, companies can store and analyze *everything*.”

Today, the question companies should be asking about data is: *If we can take away computing and storage constraints, what value can we add?* New technologies enable companies to keep all their data in one place and to use much more data. However, the challenge remains as to how best to organize it and how to capture context and meaning in order to get to the most useful insights. In short, big data increases the volume and velocity of data available and reduces the costs involved, but companies must still decide how to dissect it to turn data into insights. “Simply making data available is no guarantee of value. Organizations need data context, centres of excellence, and governance to manage it properly,” he said. However, it is not necessary to spend large amounts of money to demonstrate value, he added. “Expensive analytics projects are not required to get started with big data. Companies should start small and focus on proving value at each step.” He noted that it is possible to begin inexpensively with open systems, which are scalable and require no licences. “While you wouldn’t want to run an entire enterprise this way, you can start small and then add variables and improve your models. The key is learning how to manage and grow and think about data. If you don’t begin, you don’t know what you can leverage.”

Big data is still an immature concept and companies should therefore adopt it in an evolutionary fashion rather than in a “big bang”. However, it cannot be ignored. “Big data is going to be a part of your business,” he explained. “The question is, *how big?*” Participants asked whether they should look first at internal or external data. Shreeshant recommended that CIOs look for the biggest play they can get, either on the top or bottom line. “There’s a wide gamut of opportunities out there.” The quick wins are probably internal with customer and product information. However, he suggested keeping an open mind and looking at everything. “Sometimes, relevant data spans both dimensions,” he said. Companies should also understand their tolerance for risk and experimentation and determine how to capture the data they need.

An application one firm has begun to develop is using structured and unstructured data from both internal and external sources to develop a consolidated 360^o view of its customers. In the past, disparate, siloed internal data in systems made data consolidation challenging. Massive data “plumbing” was required before analysis could begin and data definitions had to be created before

data could be stored or consolidated. The constraints of relational databases forced business to make decisions about how its data was to be stored before it was analyzed. In contrast, with big data, all types of data from multiple customer touch points are now available in one place in native form which provides the maximum flexibility of analysis. More granular data for example, allows for finer classifications and segmentations to be made and allows marketers to tailor the message to a single person if necessary. All this is done with no loss of time – in fact well implemented big data solutions provide better analytics in less time. Thus, more time can then be spent on analytics and less on data management issues.

Big data technologies, such as Hadoop, can coexist with existing data warehouses and so can be introduced slowly, replacing specific storage and computing scenarios over time. “Start with the basics to build competencies, reduce processing, and take care of the mundane, and *then* grow,” Shreeshant recommended. As a company gets some quick wins, it will be more willing to develop pilot use cases for enterprise value realization with big data. “As you move up the maturity curve, you will be able to figure out value optimization with big data,” he said.

There are still many challenges facing companies with big data however, such as immature technology, legal and regulatory considerations, ownership of data quality, expectation management, and establishing the organization structure, talent and skills to create insights and take advantage of them. “Think about presenting and telling stories to illustrate how big data could be used in your organization,” he suggested. Privacy and data quality are also critical issues that must be properly managed if big data initiatives are going to succeed. He recommended that CIOs address the following topics when considering the move to big data:

- **Strategy and business case** to define the specific objectives, success criteria and value propositions for different case scenarios and help prioritize them.
- **Architecture fit** to assess the alignment of big data technologies with existing technologies and the fit of current data architecture with new approaches.
- **Organization preparedness** to develop and acquire the new skills, methods and approaches needed to manage data differently. A roadmap of change should also be developed.

- **Vendor selection/technology evaluation** to consider inter-operability, maturity, and functionality of the wide variety of technology offerings in the big data ecosystem.
- **Proof of concept execution** to implement both big data technology and demonstrate its successful application. Typically, value can be demonstrated in small increments of about three months. Proofs of concept should be developed for both business and technology value.

Shreeshant stressed that IT skills will have to change over time. At first, staff will be needed to oversee the implementation and appropriate use of the new technologies. Following this initial phase, analytics can be developed to monitor what's being done with the data. It is also critical to develop people with a combination of business, analytics, and data skills, who are not isolated from the business because often decisions must be made quickly.



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