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Analytics Trends 2015

A below-the-surface look



If some of the hype around business analytics seems to have diminished, it's not because fewer companies are embracing the discipline. On the contrary, analytics momentum continues to grow, moving squarely into the mainstream of business decision-making worldwide. Put simply, analytics is becoming both the air that we breathe—and the ocean in which we swim.

Analytics innovators continue to push the edge, looking for new ways to gain advantage over slower-moving competitors. In some cases, that advantage comes through sweeping discoveries that can upend entire business models. In other cases, more modest insights may emerge that unleash cascading value. For 2015, leading companies are working on both fronts to strengthen their competitive positions. These significant trends are in play—and in 2015, one supertrend is the context for everything that follows.





SUPERTREND

Quadruple down on data security

There is no pretty way to say it. In 2014, the business world got walloped on the issue of data security. And there are few reasons to believe that 2015 will be much better. Business and tech leaders alike are deeply anxious about this issue, and they're attaching big budget numbers to data security. In our experience, that sets the stage for some serious inefficiencies in technology investments in the near future—inefficiencies that analytics could guard against.

Exponential growth in the areas of mobile data generation, real-time connectivity, and digital business have made the job of protecting these assets and securing the gates in a “big data” world an altogether different—and more challenging—undertaking. In topics ranging from intrusion detection to differential privacy to digital watermarking to malware countermeasures, analytics is already having a huge impact. Add in increasing global instability and the threat of cyberterrorism, and the risks grow exponentially.

With the volumes of data being captured and managed by organizations today, analytics is the first and last line of defense for data security. Getting it right requires the convergence of innovation, analytics, digital connectivity, and technology—all integrated into a more seamless approach with fewer holes. It's not good enough to be great at analytics if you can't convert it into a strategic asset and tie it to digital execution. That applies to all the trends discussed in this report, not just the escalating importance of data security.



The Analytics of Things

The Internet of Things generates massive amounts of structured and unstructured data, requiring a new class of big data analytics to uncover and capture value. In the hands of talented analysts, these data can generate productivity improvements, uncover operational risks, signal anomalies, eliminate back-office cycles, and even drive enhanced security protocols. But the growing use of sensors isn't limited to industrial equipment and complex systems. The Internet of Things also includes wearables, ranging from smart glasses to smart watches to smart shoes and more—devices that bring entertainment, health monitoring, and consumer convenience to everyday life.

Analytics tools and techniques are already finding their way around the Internet of Things, but the integration of systems is lagging. Both consumer and industrial applications could potentially benefit from industry standards that help avoid the massive programming investments that would otherwise be required. Also, because sensor data tends to be noisy, analog, and high-velocity, there are major challenges that traditional analytics architectures and techniques don't handle well. This is especially true if you want to integrate sensor data and historical structured data in real time.

The So What:

Ever heard that old saying, "Your eyes are bigger than your stomach"? It's another way of saying your appetite may cause you to fill your plate with more food than you can actually handle. If there's a danger in the combination of analytics and the Internet of Things, that's it. Yes, we've reached the moment where the Internet of Things is becoming a day-to-day reality. Yes, if we could make sense of it all, we could do amazing things. And, yes, analytics capabilities are finally strong enough to take it on. Achieving a higher level of integration between analytics systems and their consumer and industrial application counterparts can help bring these insights within reach.



Monetize this?

Growing numbers of analysts and researchers insist that data not only should be managed as an asset but also should be valued as one. They see a future where companies can routinely monetize their own data for financial gain. For example, when consumers shift to online and mobile applications for shopping, the digital exhaust they create can have significant potential. But sometimes their digital exhaust is simply that: information with little value. You have to understand which situation you're facing.

Data monetization initiatives clearly make sense in some sectors, and they are already fueling new products and service approaches. In other domains, results have been mixed. Companies often jump in without realizing that being a content provider can be risky business. Many lose money, or at least take a very long time to become profitable.

Some of the risks come from regulators and consumers who see threats to privacy. In addition, a growing number of data scientists themselves are expressing concern over whether their activities are socially useful. One prominent researcher in the field is already writing a book that examines data analytics applications that may have negative social consequences. Regardless of the individual circumstances, look for the importance of data ethics to grow as the pressure for monetization continues.

There's an emerging perception that the more data you have, the better. In fact, more data brings more challenges. Capturing, storing, and protecting data comes with real costs.

The So What:

Blockbuster superhero movies often contain a familiar trope: the hero or villain who is given a weapon that is far more powerful than he expects. Unprepared for the awesome power of the weapon, the recipient tends to misuse it, with either disastrous or humorous consequences. Sound familiar? The potential of data as an asset is so great that some companies are rebuilding their strategies around this asset. Some—first online businesses and now industrial firms as well—are already beginning to prosper, but others are underestimating the great responsibilities that come with this potential power—responsibilities not only to the business but to society at large. If “data ethics” is an unfamiliar term, it should probably be playing a bigger role in your data strategy.



Bionic brains

The convergence of machine and human intelligence is disrupting traditional decision-making by equipping people with knowledge that was almost unimaginable just a few years ago. The connections between people and machines are becoming both more natural and more familiar, creating better and faster decisions throughout the value chain.

With the rise of big data and machine-to-machine communications, analytical models and algorithms are increasingly being embedded into complex event processing (CEP) and other automated workflow environments. Automated decision-making is probably here to stay, enhanced by a host of cognitive analytics applications.

In practical terms, cognitive analytics is an extension of cognitive computing, which is made up of three main components: machine learning, natural language processing, and an advanced analytics infrastructure. Cognitive analytics is the application of these technologies to enhance human decisions. It takes advantage of cognitive computing's vast data-processing power and adds channels for data collection (such as sensing applications) and environmental context to provide practical business insights. If cognitive computing has changed the way in which information is processed, cognitive analytics is changing the way information is applied.

Cognitive analytics is still in its early stages, and it is by no means a replacement for traditional information and analytics programs. However, industries wrestling with massive amounts of unstructured data or struggling to meet growing demand for real-time visibility are taking a closer look.

The So What:

Cognitive computing and analytics appear to be capable of improving virtually any knowledge-intensive domain to which they are applied. The entire phenomenon, however, raises questions about the respective roles of humans and knowledge workers. No large-scale replacement of highly trained employees is on the immediate horizon. But as cognitive systems move from chess and TV game shows to real business applications, knowledge workers are justifiably anxious about their futures. Both individual workers and organizations need to learn how these systems can augment the work of talented humans rather than fully automating it.



The rise of open source

Once restricted to Silicon Valley, open source solutions such as Hadoop are finding their way into the enterprise and being used by mainstream firms around the world as data storage and processing engines. And it's just one of many open source solutions that are finding their way into the enterprise. Others include Mahout for machine learning, Spark for complex event-processing, and specialized tools that are being adopted alongside commercial software. And, of course, there's R, the open source language and environment for statistical computing and graphics.

The key to an open source initiative is finding the distinct value that can come from adopting the solution. Open source can have a distinct role, but it generally has to be part of a broader overall strategy. For example, Hadoop can be effective when you have "real" big data that is multistructured, volume heavy, and slow to process. It's a case of finding the right tool for the job.

Risk management must also be part of the equation when an open source tool is used. What happens if the army of volunteer open-source developers moves on to the "next big thing"—or simply wants to be paid? What if the quality of the solutions declines along with the quality of talent working on them? It's easier to calculate your risk exposure if you have a clear picture of the portion of your infrastructure that relies on, or is built on, open source solutions.

Open source solutions come with unique benefits, not the least of which is economic value. That said, companies have to keep in mind the cost and availability of people who can work with these emerging technologies. Those people are getting harder and harder to find.

The So What:

Open source solutions are real, compelling, and valuable today. Many tech leaders would say the rise of such solutions has been a long time coming—and they're hungry to put these capabilities to work. They could be rushing too fast. Leaders must be sure that the open source solutions they are putting in place today will sit comfortably alongside their overarching technology strategy. They must also make sure their reliance on open source solutions doesn't leave the organization exposed to more risk than anticipated. Open source solutions have earned their place in today's technology strategies. The key is knowing their place.



Tax analytics: Striking gold?

Despite being focused on numbers, tax leaders within companies have been slower to adopt analytics.¹ The leading companies that are beginning to address the area focus primarily on tax planning, with the goal of reducing taxes and better understanding the financial implications of different tax decisions.

Historically, companies have not generally captured their tax situations and outcomes in structured formats. This made it difficult to develop models that link tax circumstances and attributes to specific tax payment outcomes. In addition, tax structures and data can be extremely complex, especially for global corporations operating in multiple jurisdictions.

Despite these difficulties, companies have increasing numbers of common data sets that tax leaders can leverage to bring more fact-based insights to each organization. This is a good sign—particularly as CFOs and Chief Accounting Officers apply analytics principles with greater frequency. Along with tax leaders, they can pull an organization together through a greater focus on data.

Some of the most interesting work in tax analytics today is on simulation models that explain or predict tax levels under particular circumstances. If the tax rate was 32 percent last year and 34 percent last quarter, executives want to know why the rate is changing.

The tax planning of the future will likely be more analytical than it is today. Astute tax executives should be preparing now by working on data infrastructure, assembling the right people and skills, and acquainting managers with the art of what's possible. It's time for the quantitative field of tax to take its game to the next level.

1. Davenport, Tom. "Tax Analytics: From the Inside Out." 2014.

The So What:

"Be prepared" is a good motto for leaders taking on tax analytics. Many governments around the world are requiring more and more tax data to be submitted in standard electronic formats. This is not merely to be more efficient or save a few trees. The reason many of these governments are requiring this is so that they may perform their own analytics from both technical and industry perspectives. They are also changing the way that they conduct audits. It may be important to understand what trends your organization's detailed data might reveal before you extend access to large amounts of data.



Universities step up

The marketplace is looking for a supply of true data scientists, not just button pushers. Many universities are working to serve this need. As analytics grows to pervade wide-ranging professions and business models, the stakes are getting higher.

From journalism to medicine to HR and beyond, the convergence of analytics and other disciplines is upending expectations for insights across the board. In some industries, such as entertainment, companies are using data to motivate decisions on product development, marketing, talent, and more. Think of it as “Moneyball for Movies.” It’s a big deal.

It’s great news that higher education is beginning to churn out thousands of data scientists and quantitative analysts. But as universities find themselves facing increased expectations to support the new data economy, the pressures will build. There’s likely to be a shakeout. Some new programs won’t turn out strong data scientists in sufficient numbers, for a variety of reasons. For the longer term, it will be essential to have an abundance of students with solid quantitative prerequisites entering and succeeding in these programs.

The So What:

“STEM”—shorthand for the academic disciplines of science, technology, engineering, and mathematics—has been one of the hottest buzzwords on college campuses for years. Today, some are beginning to talk about “STEAM” instead, adding an “A” for Art. This is good news for the business world, which is looking to such programs to deliver the necessary analytics talent. Businesses are increasingly on the hunt for people who can balance quantitative analysis capabilities with an ability to tell the story of companies’ data in compelling, often visual, ways. Put simply, design thinking, visualization, and storytelling are increasingly important. Core STEM disciplines provide the necessary foundational capabilities for new data science talent entering the workplace—but on their own, they are no guarantee of analytics success. “Liberal arts” skills are also needed to frame the right questions, think critically, collaborate with domain experts, and explain technical assumptions and results to non-technical audiences.

As universities continue to add analytics and data science programs and the business world hires and deploys these graduates to create value, a strong feedback loop is needed to ensure the appropriate linkages between technical expertise and domain knowledge, organizational context, communication excellence, and user experience.



Accuracy quest

The data brokerage business has only grown hotter as analytics capabilities have experienced exponential growth. That's unlikely to change for the near future. But as those who purchase and use this data grow more familiar with it, they're applying more scrutiny to the product they're being sold. Maybe that's because the possibilities for what happens at the next level of data accuracy are so tantalizing.

Today, data scientists and other informed buyers of data are generally aware of a fundamental paradox at work in big data: It is directionally accurate but often individually inaccurate. A company may know quite a bit about buyers, which is valuable, but it may not actually have as much accurate information about particular buyers as you might expect. Which in turn means that the data is simultaneously inaccurate and valuable. Let's call it "semi-accurate"—the inaccuracies are not totally random, in many cases.

If data brokers could improve the quality of the data they're providing, they would have the potential to increase the value to marketers by order of magnitude. Progress is being made, but it's frustratingly slow. The ability to gather and leverage detailed and accurate information about current and potential customers could allow marketers to better tailor specific advertisements and offers to consumers, target customers for optimized offers, and reduce offers to disinterested customers. That's why we anticipate increased pressure on data brokers to improve the accuracy of their data over the next year.

The So What:

Micromarketing and microsegmentation at the consumer level can provide a big competitive advantage for companies looking to break away. Today, many marketers continue to settle for "better than nothing" improvements to their current targeting approaches or, perhaps even worse, a so-called "spray and pray" approach to mass marketing. Data inaccuracy is one of the most significant obstacles, and in a world where companies increasingly rely on external sources for their marketing data, the pressure is on for data brokers to deliver the goods.



Bubbles to watch

Which trends-in-the-making are we likely to be talking about a year from now? Keep your eyes on these.

Facial recognition and geospatial monitoring. From tagging friends in photographs and recognizing customers to catching criminals by tracking their movements in society, there are many reported successes of these types of technologies. Data from inexpensive cameras and cellphones is now widely available to train machine learning systems. Expect to see plenty of innovation in this field.

Citizen backlash. Between government monitoring, data breaches, and well-intentioned commercial efforts that cross the “creepy” line, people are starting to realize just how much can be learned about them from the data they unintentionally produce. It may not be long before we see public demands for enforceable accountability on those who collect or disseminate personal data.

Analytics driving the physical world. Technology that controls physical activities (think of the Google self-driving car, or even the Nest thermostat) has received a significant amount of media attention. Many consumers seem eager for these analytics-enabled capabilities today. In the rush to serve consumer appetites, it will be important for businesses to thoroughly plan for the potential consequences—good and bad—of these capabilities.

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