

# Business Analytics Insight: Hype or Here to Stay?



**Hugh J. Watson** is a Professor of MIS and holds a C. Herman and Mary Virginia Terry Chair of Business Administration in the Terry College of Business at the University of Georgia. He is senior editor of the *Business Intelligence Journal*.  
hwatson@uga.edu

## Hugh J. Watson

We all know that analytics is a hot topic. It would be hard to miss the large number of books, articles, research reports, Webinars, and survey findings that suggest its importance. Despite the recent attention, I feel that analytics is not fully understood. There are many incorrect, imprecise, and incomplete understandings. I'd like to share 10 important and interesting insights about business analytics.<sup>1</sup>

### #1: Analytics Has a Longer History than Many People Think

Even though the term analytics has become popular in the past few years, its roots date back many years. In the late 1960s and early 1970s, the first decision support applications appeared. They were most often called decision support systems (DSS), and over the years, this term was used to describe specific applications or as the name of a field or discipline (as it is still often used in academia). Over time, other decision support applications emerged, such as executive information systems (EIS) and online analytical processing (OLAP), which became part of the decision support applications portfolio.

In the late 1980s and early 1990s, data warehousing (DW), and soon afterward, business intelligence (BI), entered the decision support lexicon. BI, in particular, has been used as an umbrella term to describe the technologies (e.g., data cleansing tools), processes (e.g., data governance), and applications (e.g., dashboards/scorecards, OLAP) for supporting decision making. Today, the word analytics is often used as an umbrella term.

<sup>1</sup> I'd like to thank Doug Laney at Deloitte for his comments and perspectives on analytics.

Some people think of analytics as the data analysis component of BI, and that BI is a larger environment that includes everything needed to support analytics, such as a data warehouse. However, even when the focus is on mathematical and statistical modeling, this harkens back to operations research and management science (OR/MS), which predate even DSS.

Why all the name changes? It isn't that the previous names were bad; more likely, vendors, consultants, writers, and others who offer decision support products and services saw the opportunity to have people and companies take a fresh look at their offerings by promoting them as new and different.

## #2: "Analytics" Means Different Things to Different People

In the broadest use of the term, analytics involves the analysis of data using statistical and mathematical techniques. This includes performing multidimensional analyses (i.e., OLAP), calculating performance metrics for inclusion on dashboards/scorecards, conducting market segmentation analysis for designing CRM campaigns, and using mathematical programming for revenue management.

These are clearly very different kinds of analytics, and the differences have important implications for where they are used, who performs them, the skills that are required, and the technologies that are involved. For example, the skills needed to use and understand sophisticated data mining/predictive analytics techniques are different and greater than for performing OLAP. To avoid confusion, be clear about what kind of analytics you are discussing.

A useful distinction can be made among descriptive, predictive, and optimization analytics. As the names suggest, the different kinds of analytics describe a situation, make inferences about it, or suggest an optimal solution.

The following list categorizes the variety of analytics.

### Optimization analytics

- Mathematical programming (e.g., linear, integer), simulation

### Predictive analytics

- Decision trees, CART, genetic algorithms, neural networks

### Descriptive analytics

- Data visualization
- Dashboards/scorecards
- Drillable/OLAP reports
- Published reports
- SQL queries

There are other classification systems that are appealing and useful. For example, Deloitte distinguishes among analytics that provide (1) an understanding of what happened (hindsight), (2) an understanding of why it happened (insight), and (3) an understanding of what will happen (foresight).

## #3: Analytics Is Becoming a Competitive Requirement

I've used the term "BI-based organizations" to describe those firms where BI is more than a "nice-to-have" and is now a requirement for competing in the marketplace (Watson, 2010). The number of these firms is growing rapidly. Some of the earliest, most successful firms used analytics as an enabler to support new business strategies.

For example, when the gambling laws changed to allow gaming on Indian reservations and riverboats, Harrah's Entertainment adopted a growth strategy that included building new casinos and buying existing properties. The

strategy also included creating a Harrah's brand and incentives to encourage customers to play at Harrah's wherever they traveled. Key to this strategy was understanding customers well and extending offers that would entice them to gamble at a Harrah's casino.

Harrah's became an industry leader by using analytics in such areas as customer profitability and expected lifetime value analysis, customer segmentation analysis in campaign design, control and experimental group testing to better understand which offers work best with different market segments, and revenue management analytics to optimize hotel room revenue.

While most companies don't share Harrah's high profile in their use of analytics, many do depend on analytics to compete. They base decisions on data rather than intuition. Their understanding of customers' wants and needs are based on analytics. They run experiments to determine what works best, such as examining alternative Web site designs. Analytics are used to analyze current business processes and to design better ones, and analytics are integrated into work flows to monitor and increase their efficiency and effectiveness.

#### #4: Analytics Is Overhyped but Is Here to Stay

You can't miss all the resources (e.g., articles, books) that describe the wonderful things companies are doing with analytics. Just wait. It won't be long until there are publications that discuss the failures in using analytics. This hype-and-failure publishing cycle always occurs with new technologies and applications.

Is analytics overhyped? Probably so, but it is too important to go away. Analytics' ultimate success, however, Business Analytics depends on how well companies make the required organizational (e.g., focus on fact-based decision making) and technological (e.g., a scalable, flexible BI infrastructure) changes, and the business value these changes create.

#### #5: Big Data Is Changing the Scope and Technologies for Analytics

We are in the era of big data. In addition to the usual structured data from operational systems, organizations

are capturing and storing less-structured data from their Web sites, call centers, e-mail, documents, social media, and elsewhere. There are more data sources, and the data is arriving at a higher velocity. This vast amount of data contains a wealth of potentially useful information but creates challenges for capturing, storing, and analyzing it.

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If BI directors fail to plan for and integrate big data into their BI strategy, governance, architecture, technologies, processes, and activities, they risk facing a vacuum filled by the business units, resulting in a new generation of analytic silos.

Sentiment analysis illustrates the usefulness of being able to analyze big data in general and data from social media in particular. Consider a company that has introduced a new product and wants to know the public's reaction to it. Sales figures are useful and important, but what the public is saying about the new product is also valuable.

Using data from social media and employing text mining techniques, a company can learn whether they have a winner or loser on their hands or what problems need to be resolved quickly.

New technologies are emerging that can be used to store and analyze large amounts of poorly structured data. For example, Hadoop and MapReduce are open source technologies that distribute data and analyses across many computers, breaking the analysis into many parallel workloads that produce results faster. Companies such as Yahoo!, Twitter, and eBay that must work with huge amounts of data were some of the early adopters. In addition to these technologies, BI directors must become familiar with the technologies and processes for capturing new kinds of data and the specialized tools for analyzing it.

## #6: BI Platforms Are Changing

BI platform discussions once focused on which vendor's offering was the best (e.g., Teradata, IBM, Oracle) and whether the Inmon (hub-and-spoke) or Kimball (datamart-bus) architecture should be used. Now there are many other considerations. For example, data warehouse appliances from vendors such as Netezza (now an IBM company), Greenplum (now part of EMC), DATAlegro (now part of Microsoft), and Teradata can be used to off-load specific analytic applications or even to host an entire data warehouse.

These appliances strive to integrate hardware, operating systems, databases, and analytic applications to provide optimized, powerful, and cost-effective solutions. Some appliances (e.g., Aster Data) employ a columnar database to increase query processing speed. The cloud is now an option for BI and analytics. It can be used for targeted work, such as providing an environment for developing a new analytical application, or for hosting some or all warehouse data.

Some analytics are moving inside the warehouse database. For example, SAS is working with other vendors such as Teradata and Oracle to provide in-database data mining and predictive analytics, which eliminates the need for ETL to a separate server to perform the analytics. Some companies are finding it best to provide a separate BI platform for power users and applications that have heavy processing requirements. This approach, possibly using an appliance, helps take the workload off the main data warehouse accessed by casual users and less computationally intensive applications.

Also focusing on improving processing speed are inmemory BI tools (e.g., QlikView from QlikTech) that store large amounts of data drawn either from source systems or a centralized repository.

As you can see, there are many new things to think about when planning your BI platform.

## #7: Analytics Are Used in New Places

Most people don't think of human resources (HR) as being an area ripe for analytics. In fact, in some companies, HR is an important user. This makes sense when you consider the money invested in personnel and the likelihood that when analytics is used elsewhere in a company, it will filter its way into HR. Consider several interesting examples:

Some companies receive a large number of job applications that must be screened. This is especially true of large and "destination" companies (e.g., ESPN, Google).

Predictive analytics can be used to identify the attributes that are best for predicting job performance and thus score applicants for positions. With this approach, every application is considered, but only the "best" applicants are interviewed.

Other companies use analytics for workforce planning and optimization. For example, simulation models can assess the supply and demand for workers with specific skills (e.g., electrical engineers) over time to have the right number at the right time. As conditions change, the models can be rerun to update hiring and retention plans.

## #8: Analytics Requires a Diverse Set of Skills

Analysts who perform analytics must have a diverse set of skills: the ability to work with large data sets as well as an understanding of analysis methods, domain knowledge, and communications skills. Few people are strong in all of these areas. An analyst may not possess all of these skills, but someone on the team must. Organizations must also be prepared to develop internal, analytics-oriented training programs to grow necessary skills.

## #9: There Is a Shortage of People with Analytics Skills

Years ago, analytics courses and degree programs were more common in business schools than they are today. In addition to a course in statistics, students typically had to take a course in quantitative methods, where topics such as linear programming and simulation were taught. There were departments of Management Science and Decision Sciences that taught and researched analytics.

When I teach a graduate course in BI today, it is only the international students, typically from India, who are familiar with topics such as linear programming.

Beginning in the 1980s, many Management Science and Decision Sciences departments were disbanded. The end result is that most students coming out of business schools today have limited training in analytics.

Because of the need for people, some schools are ramping up to meet the demand (Wixom, et al, 2010). Deloitte's graduate-level certificate program with Indiana University is one. North Carolina State University, St. Joseph's University, and the University of Denver offer graduate degree programs in BI or analytics. A growing number of MBA programs are offering a concentration in BI. Departments such as marketing include analytics in some of their courses.

Overall, however, the pool of business school graduates with significant analytics training is small. Companies need to include graduates in statistics, mathematics, computer science, engineering, actuarial sciences, econometrics, and some of the social sciences in their search for people with advanced analytics skills. Be careful, though. Knowledge of analytics without any business training, experience, and perspective is of limited value to companies. Organizations also need to look internally to find people with a strong knowledge of the business who can work with data, have a demonstrated ability to use Excel, Access, and OLAP tools, and have inquisitive minds.

### #10: Advanced Analytics Are Packaged Better

It used to be that only “rocket scientists” (e.g., those with graduate degrees in statistics) could use advanced analytics. This is changing as analytics are being integrated into packaged applications.

For example, consider software that designs marketing campaigns by determining which customers should receive an offer. In the typical package, the software assists in selecting the sample data—people who have and have not responded to a similar past offer. Using this data, the software builds alternative predictive models and helps select the best one. (This is where the predictive

analytics is performed.) Next, the best model is used to score the candidates in the target population.

The final decision about who will receive the offer depends on the probability that each person will respond, the profit to be gained from those who do, and the cost of those who don't. The software considers all of these factors and recommends the optimal candidates to include in the campaign. The analyst still needs to know about campaign design, the handling of data, and the use of analytics, but most of the “heavy lifting” is performed by the software. ■

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