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Distinctive Capabilities

Winning with analytics

By Jeanne G. Harris

Despite years of talk about scorecards and operating metrics, too many businesses still make critical decisions based on gut feeling and that amorphous quality called experience. But new research reveals a clear link between business performance and the use of analytics to drive fact-based decision making. Here's how your company can exploit the power of analytics to out-think and out-execute the competition.

When France lost the 2006 World Cup soccer final to Italy, many fans blamed French superstar Zinedine Zidane, red-carded off the field for infamously head-butting an Italian player. But other observers credited Italy's win to something far more subtle: the sophisticated analysis of data.

Prior to signing contracts with the team and fortnightly thereafter, several of the Italian national team's players were evaluated at Milan Lab, a biomedical research unit set up by the AC Milan soccer club to gauge the performance and injury potential of the footballers, who are among the world's best-paid athletes.

The club considers the lab a key competitive advantage—a tool for improving the return on its investment in these two-legged assets. The lab can track 60,000 data points on each player—200 on one jumping motion alone. The analysis of such data is used to ensure the health and fitness of the players. This information has helped the soccer club build one of Europe's leading teams and create a World Cup winner by investing wisely in players, an important capability in a business whose top employees cost millions of dollars per year.

On the other side of the Atlantic, the owners and coaching staff of the New England Patriots

football team, like their Milanese counterparts, are highly successful practitioners of analytics, a term that refers to the extensive strategic use of data, statistical and quantitative techniques, explanatory and predictive models, and fact-based management to drive decisions and actions. In part because of this analytical focus, the Patriots have become an American football dynasty, winning three of the past six Super Bowls.

But it's not just professional sports teams that use analytics to beat the competition. Businesses as diverse as global cement giant CEMEX, California winemaker E. & J. Gallo Winery, tractor maker Deere & Co., UK-based super retailer Tesco and Bank of America Corp. are out-thinking and out-executing their competition with analytics.

Traditional bases of competition are eroding fast. Innovation in products and services is more challenging by the day. Companies that do come up with innovative features often find them easily and quickly replicated—perhaps half a world away. Product lifecycles keep shrinking, yet customer expectations keep climbing. In this environment, execution is paramount. And superior execution requires companies to make ever-smarter, better-informed decisions—which, in turn, require superior analytics.

This has been confirmed by Accenture research, which found that high-performance businesses—those that substantially outperform competitors over the long term and across economic, industry and leadership cycles—are twice as likely to use analytics strategically compared with the overall sample, and five times more likely to do so than low performers. High performers know that technology on its own cannot make a company into an effective analytical competitor. Their managers are also wise to the mistake of equating analytics with the collection and storage of data.

Shaping strategy

But while our research shows that executives are increasingly aware of the power of information technology to help make better decisions (see sidebar, page 55), many organizations are using analytics in only limited ways. For instance, a manufacturer may track, interpret and use data to improve how it manages product quality, and a marketing group might base decisions on the long-term analysis of different customer segments. However, only a handful of companies are using analytics as a foundation for their business strategies.

Take Netflix, the movie rental company, which has grown from \$5 million in revenue in 1999 to nearly \$1 billion in 2006. At the heart of Netflix's business is a complex formula—a movie-recommendation “engine” based on proprietary software. Cinematch, as the tool is called, analyzes customers' choices and feedback on the movies they have rented—more than a billion ratings overall of movies they have liked, loved, hated and so on—and recommends movies in ways that optimize both the customer's taste and Netflix's inventory. Says CEO Reed Hastings: “If the Starbucks secret is a smile when you get your latte, ours is that the website adapts to the individual's taste.”

Analytics also help Netflix decide what to pay for the distribution rights to DVDs, essentially giving the company a powerful information advantage during negotiations. For example, when Netflix bought rights to *Favela Rising*, a documentary about Rio de Janeiro musicians, company executives knew that a million customers had rented 2003's *City of God*, also set in Rio. About half a million had rented the Oscar-winning documentary *Born Into Brothels*, and 250,000 had seen both. So Netflix paid a fee based on 250,000 rentals. If it rents *Favela Rising* more times

than that, the film's producers and Netflix split the upside.

Netflix board member Richard Barton calls the company's business model "*Moneyball* for movies," a reference to Michael Lewis's groundbreaking book about the use of statistics in professional baseball.

Other examples come from diverse industries. CEMEX has successfully used analytics to optimize its supply chains so that it can provide faster delivery than its competitors; as a result, the company is able to charge a premium for its cement products. Gallo, operating in a business built on using intuition to divine unpredictable consumer preferences, now quantitatively analyzes and predicts the appeal of its wines. Between 2002 and 2005, tractor maker John Deere saved more than \$1 billion by employing a new analytical tool to better optimize inventory. Bank of America uses analytical capabilities to manage risk consistently across the enterprise.

Getting started

Analytics can support almost any business process. The strongest analytical competitors focus most of their data efforts on supporting their distinctive capability—a unique, customer-centric combination of integrated business processes and resources that sets them apart from their competitors (and that is one of the three building blocks of high performance). They use analytics to extract every last gram of value from these processes and key decisions. (For a few, analytics *is* their distinctive capability. Consider Capital One, the financial services provider, which is very open about its use of data analysis to differentiate among customers based on credit risk, usage and other characteristics, and to match customer characteristics with appropriate product offerings.)

Becoming an analytical competitor calls first for a clearheaded recognition of where your company is positioned in terms of its current use of and aptitude for analytical processes. There are five discrete stages of analytical competitiveness: analytically impaired; localized analytics; analytical aspirations; analytical companies; analytical competitors (see chart, page 4).

Companies should first determine which stage they are in and then discuss how to move to the next stage. Relatively few companies of any sophistication are "flying blind"—that is, analytically impaired. However, even fewer are found at the most advanced stage, that of being full-fledged analytical competitors. Common to all those aspiring to that level of competitiveness is the need to focus on developing four fundamental assets.

1. Leaders who "get it."

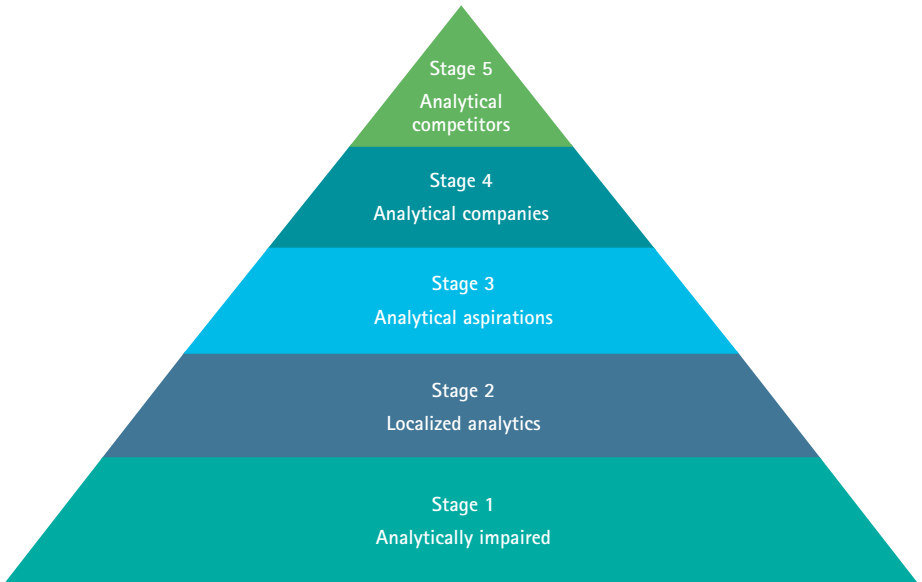
Taking a broad analytical approach to business calls for big changes in culture, process, behavior and skills for many employees. Such changes must be spearheaded by senior executives who are passionate about analytics and fact-based decision making. The ideal primary advocate is the CEO, as is the case at such analytical exemplars as Netflix (Reed Hastings), Amazon.com (Jeff Bezos) and Capital One (Rich Fairbank). These executives have stated both internally and publicly that their companies are active in some form of analytical competition. Another analytics champion—Harrah's Entertainment CEO Gary Loveman—regularly asks employees, "Do we think this is true, or do we *know*?"

2. People who love numbers.

Executives like Loveman do not confine their analytical prowess to a single division or business unit. Theirs is an enterprisewide view—they want to establish a fact-based

Five stages of analytical competition

There are five stages of analytical competition. Companies need to first determine where they are and then what they need to do to move to the next level.



culture across the organization and extend it to their suppliers and other partners. So it is very important that they have employees who are data-” training and rewarding for analytical skills—especially at management levels. It also points to the need to understand where those skills matter most and where they will matter more in the future. We expect that the growth of analytical competition will require the development of a core of data-oriented professionals surrounded by a larger group of analytically astute information workers that we call *analytical amateurs*.

In the companies we studied, the numbers of core data analysts range from about a dozen to more than a hundred in the case of Procter & Gamble. The consumer-goods giant has analytical professionals supporting a variety of functions, including supply chain and marketing.

Interestingly, most companies have, to some degree, centralized their elite analysts. P&G, for example, took

analytical teams that had been dispersed around the organization and combined them to form a new Global Analytics group as part of the IT group. Schneider National, the transportation company, also has made its central analytical group part of the IT domain.

It’s already obvious that businesses need more numbers-driven graduates—and that it is their responsibility to train staff in a range of analytics skills. Many frontline data pros will continue to come from the business schools, of course. But an advanced degree in applied mathematics may replace the MBA as the fast path to an executive career.

3. Processes that revolve around facts.

Analytical competitors begin with “a single version of the truth”—not the conflicting views of the same metrics that stymie other companies. In too many businesses, leaders from different silos regularly clash over perspectives supported by data

developed within and suited to each silo's operations. What's needed is an integrated, cross-enterprise view of the data—a state that may require business process redesign on a broad scale.

Many companies implement ERP systems with such goals in mind. For example, the CEO of Earthgrains Co. (the baked-goods company acquired a few years ago by Sara Lee Corp.), insisted that the entire organization needed better data, and led the company to implement a new ERP system to create that data. Then he continually required his managers to use the system when deciding what products to keep and

which customers to serve. With a projector set up in the executive meeting room, the CEO required managers to present their cases using hard facts.

The good news is that there are tools that enable such redesign without excessive pain. Sales, marketing, finance and supply chain staff are seeing substantial benefits with sales and operations planning processes, for instance. Similarly, product lifecycle management software is helping designers, manufacturers and financial managers to speak the same language and base decisions on common data and assumptions.

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The curse of dirty data

For many organizations, when it comes to analytics, the problem is not so much that they lack data. The biggest challenge is that they do not know which data is trustworthy—"clean," in the parlance—and which contains duplicates, outdated records and erroneous data entries.

According to Gartner, an alarming proportion of all business data is inaccurate. The research firm estimates that through 2007 at least 25 percent of critical data collected by Fortune 1,000 companies will be inaccurate.¹ In a separate study by a leading accounting firm, only a little more than a third of executives were "very confident" in the quality of their corporate data.²

A company that finds it has poor-quality data should postpone any plans to compete on analytics and instead should fix its data first. UPS—clearly no slouch in the markets in which it competes—exemplifies the patience that is often necessary. Although the company has been collecting information for more than five years, it took more than half that time to validate the data before it was usable.

Many companies are turning to data-quality software to find and identify duplicate and inaccurate or incomplete data. Online travel agency Travelocity is one such user; it needs to know whether customers requesting physical tickets have entered valid addresses to which overnight carriers can deliver. Previously, Travelocity would know an address was flawed only when the package bounced back. Then the company would have to find the correct address and pay a courier again to re-ship. Today, data-quality software alleviates this problem.

¹ Mark McDonald and Tina Nunno, "Creating Enterprise Leverage: The 2007 CIO Agenda". (Stamford, CT: Gartner, Inc., February 2007).

² "Dirty Data Blights the Bottom Line," *Computerworld*, Nov. 7, 2005: <http://www.computerworld.com/databasetopics/data/story/0,10801,105928,00.html>

Not just data for data's sake

Data analysis has been used in business since the dawn of the industrial era—from Frederick Winslow Taylor's time management exercises in the late 19th century to the measured pacing of Henry Ford's mechanized assembly lines. But it began to command more attention in the late 1960s when computers were used in experiments to aid decision making. These earliest "decision support systems" addressed repetitive and non-strategic activities such as financial reporting.

Statistical analysis became more routine in the 1970s with the arrival of packaged computer applications. But few executives embraced the strategic use of data; number crunching was left largely to the statisticians. One notable exception was at American Airlines, which depended on Sabre, its breakthrough yield management system, to beat its competitors.

Since then, analytics have evolved with the development of enterprise systems, data warehouses, and a wide variety of other hardware and software tools and applications. But until recently, companies have focused on analyzing historical data rather than developing predictive analytics for decision making.

Many companies today are collecting and storing a mind-boggling quantity of data. In just a few years, the common termi-

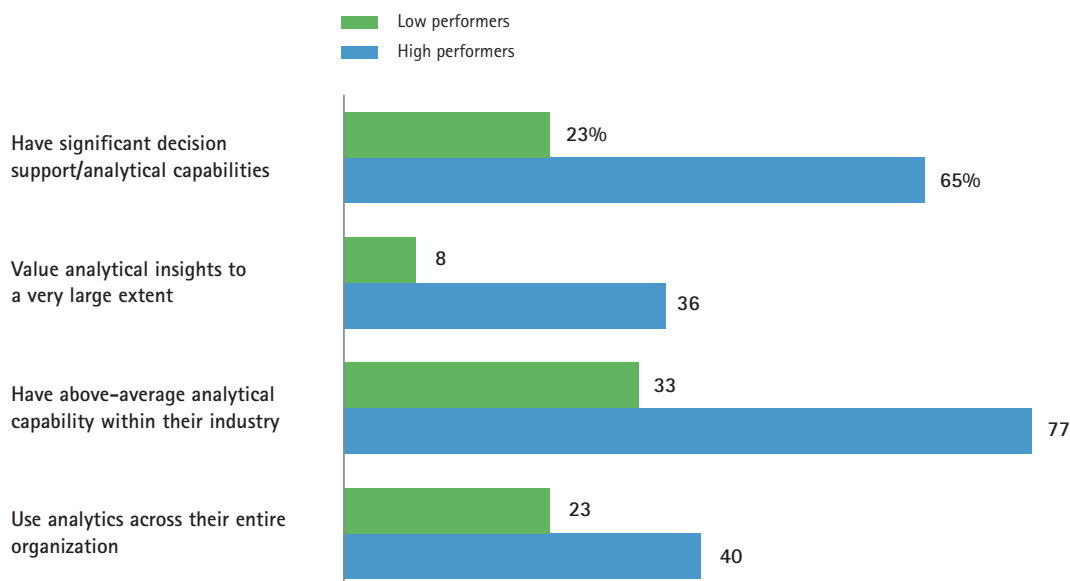
nology for data volumes has grown from megabytes to gigabytes to terabytes (TB)—a trillion bytes. Some corporate databases are even approaching one petabyte—a quadrillion bytes in size.

Just how much data is this? To put the 583TB in Wal-Mart's databases into perspective, for example, consider that in 2006, the US Library of Congress's entire print collection was estimated to take up roughly 20TB. Gargantuan storage facilities are not the only technological frontier: Statistical software, high-end 64-bit processors, and specialty "data appliances" can quickly churn through enormous amounts of data—and do so with greater sophistication.

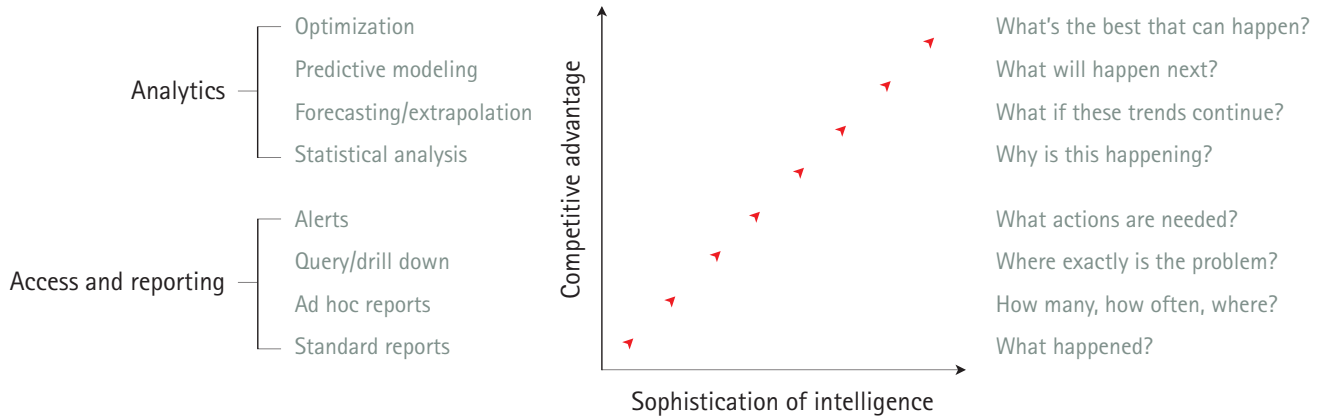
Today, these technological capabilities are often referred to as *business intelligence*, a concept that incorporates the collection, management and reporting of decision-oriented data as well as the analytical techniques and computing tasks that are performed on the data. A 2007 Gartner survey of 1,400 chief information officers found that BI is the top technology priority for IT organizations. As top performers develop their analytical capabilities, they are increasingly migrating toward more powerful techniques such as predictive modeling, forecasting and optimization (see chart, page 7).

The link between using analytics and high performance

High performers take a more serious approach to integrating the use of analytics within their organizations than low performers do.



Business intelligence technologies use data to understand, analyze and guide business performance.



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4. Technology to capture, sort and make sense of the data.

It is impossible to succeed as an analytical player if you can't trust your data (see sidebar, above).

The processing power to support an analytics thrust is readily available. There is wider use of dedicated "business intelligence appliances"—machines that are essentially supercomputers able to chew through large databases and analyses. Much of the necessary analytical software is also available. "Real-time BI," in which automated decisions are embedded in operational business processes, is gaining ground.

Concomitantly, we are seeing the emergence of what we'll call "right-time" analytics. Historically, it has taken time to extract data and make sense of it through analysis. But these days, tools exist to allow managers to use data quickly and make rapid decisions.

BostonCoach, a global executive ground transportation company, recently implemented a fleet optimization application to make real-time decisions about deploying its vehicles. The software gauges

up-to-the-minute changes in such factors as traffic and weather, enabling BostonCoach to live up to its on-time guarantee for passengers. As a result, BostonCoach has boosted the optimization of its fleet by between 10 percent and 20 percent while driving down costs.

The central challenge

There is good news for managers who want their companies to become analytical competitors: They already have much of the data they need. Their central challenge is learning what to do with it. They must also make an open-ended commitment, because developing real analytical expertise is a long-term process. Our observations suggest that it takes at least 18 months of regularly working with data to start developing a steady stream of rich insights that can translate into competitive differentiation.

So let the data analysis begin. In the colorful words of ESPN sportswriter Rob Neyer, "In business, as in baseball, the question isn't whether or not you'll jump into analytics. The question is *when*. Do you want to ride the analytics horse to profitability . . . or follow it with a shovel?" Smart business leaders are saddling up.

About the authors

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