MIT Sloan Management Review

RESEARCH REPORT

MAY 2014

In collaboration with

sas

FINDINGS FROM THE 2014 DATA & ANALYTICS GLOBAL EXECUTIVE STUDY AND RESEARCH REPORT

The Analytics Mandate

As analytics becomes a common path to business value, many companies are changing how they make decisions, operate and strategize.

By David Kiron, Pamela Kirk Prentice and Renee Boucher Ferguson

REPRINT NUMBER 55480

AUTHORS

DAVID KIRON is the executive editor of *MIT Sloan Management Review*'s Big Ideas Initiative. He can be reached at dkiron@mit.edu.

PAMELA KIRK PRENTICE is the chief research officer at SAS Institute Inc., specializing in deriving insights from qualitative and quantitative information to help address key business issues. She can be reached at pamela.prentice@sas.com

RENEE BOUCHER FERGUSON is the Data & Analytics contributing editor at *MIT Sloan Management Review*, researching the current and new analytical approaches that change how executives make decisions and innovate. She can be reached at rbfergus@mit.edu.

Portions of this report are adapted from "Raising the Bar with Analytics," *MIT Sloan Management Review*, volume 55, no 2 (Winter 2014) pp. 29-33.

Get more on data & analytics from *MIT Sloan Management Review*:

Read the report online at **http://sloanreview.mit.edu/analytics-mandate**

Visit our site at **http://sloanreview.mit.edu/data-analytics**

Get the free data & analytics enewsletter at **http://sloanreview.mit.edu/enews-analytics**

CONTENTS

RESEARCH REPORT
MAY 2014

The Analytics Mandate

The Power of the Algorithm

Few know the thrill of victory using big data better than the U.S. statistician and writer Nate Silver. His accurate prediction of the 2012 U.S. presidential election results for all 50 states made him the toast of Washington, D.C., elevating him to the status of celebrity geek. Television host Jon Stewart of *The Daily Show* called him "Lord and god of the algorithm."[1] Indeed, Silver's abilities to identify the right data sources, ask the right questions and apply the right math have turned Silver into gold.

Silver now spends much of his time talking data and managing a staff of analysts who immerse themselves in statistics and information. They discuss data and make predictions on Silver's website, fivethirtyeight.com, about everything from basketball tournaments to job growth. Though their predictions are often interesting, if not always accurate, Silver and his team are under intense pressure to stay relevant — and right. How do you sustain your momentum when you're only as good as your last prediction?

And so it goes with the new world order of big data and analytics. As more organizations make better use of data, the path to value with analytics is getting crowded — and longer. Many companies find they must reconsider and refresh not only their analytical insights, but also the organizational factors necessary to turn insight into advantage.

This report, based on a survey of 2,037 professionals and interviews with more than 30 executives, reveals the pressure companies are under to both improve their analytics capabilities and find unique and relevant insights in their data — to try to be as good as their last prediction every single day. (See "About the Research," page 4.)

As more companies look to analytics to gain an advantage, achieving such gains is becoming more difficult. That is, as analytics becomes a more common path to value, the implications for industry competition are coming into focus.

A joint collaboration between *MIT Sloan Management Review* and SAS Institute, this research analyzes the changing data landscape. It discusses the five key factors that can keep a company ahead of the analytics crowd. And it unravels the complexities of the most influential factor: the analytics culture.

ABOUT THE RESEARCH

To deepen our understanding of the challenges and opportunities associated with the use of business analytics, *MIT Sloan Management Review*, in partnership with SAS Institute Inc., has conducted its fourth annual survey, to which more than 2,037 business executives, managers and analysts responded from organizations located around the world. Our analysis includes individuals in 100+ countries and 25 industries. Participating organizations also ranged widely in size, from those organizations reporting under $250 million in revenues to those with $20 billion and over in revenues. Respondents included MIT alumni and *MIT Sloan Management Review* subscribers, SAS clients and other interested parties.

In addition to these survey results, we interviewed subject matter experts from a number of industries and disciplines to understand the practical issues facing organizations today in their use of analytics. Our interviewees' insights contributed to a richer understanding of the data and the development of recommendations that respond to strategic and tactical questions senior executives encounter as they implement analytics within their organizations. We also drew upon a number of case studies to further illustrate how organizations are using data and business analytics as competitive assets.

In this report, the term "analytics" refers to the use of data and related business insights developed through applied analytical disciplines (e.g., statistical, contextual, quantitative, predictive, cognitive and other models) to drive fact-based planning, decisions, execution, management, measurement and learning.

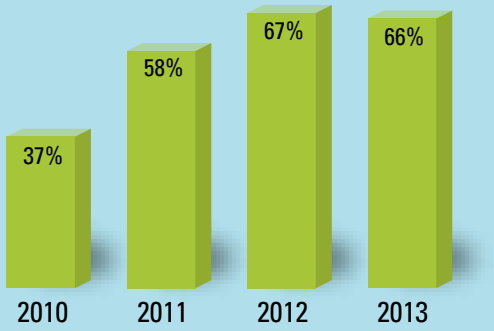
Analytics: Now a Common Path to Value

Investments in business analytics burgeoned from 2009 to 2013, with an annual average growth rate of 8.5% amid lackluster overall IT spending.[2] Even while businesses were delaying other IT investments, they were putting analytics at the forefront of the IT agenda. But as analytics has become more mainstream, the steep growth curve of companies using analytics to create a competitive advantage is flattening out. (See "Competitive Advantage from Analytics Levels Off.")

This study suggests that as the number of companies using analytics increases, it is becoming harder for some companies to gain an edge. "Analytics created significant competitive advantage in the beginning," says Douglas Hague, chief analytics officer of Merchant Services at Bank of America, one of the world's largest financial institutions and a heavy user of analytics. "Over time, however, competitors build the same capabilities and the advantage erodes. The innovation challenge is growing."

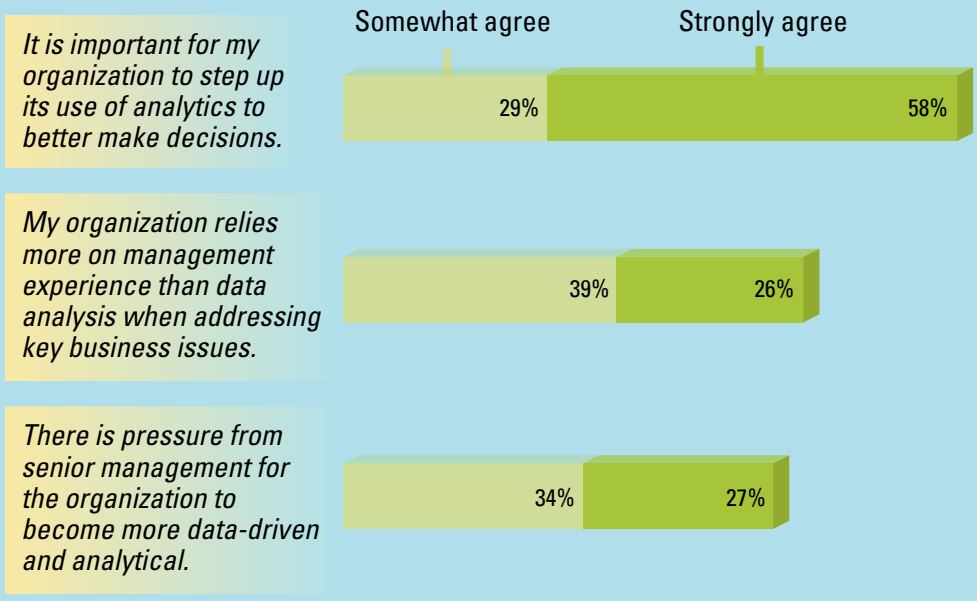
Without additional data, it's too early to classify this finding as the beginning of a downward trend. Even so, the evidence from the past three years indicates that analytics is no longer a new path to value. It's a common one, with many companies searching for ways to differentiate themselves with analytics … with varying levels of success.

Percentage believing that business analytics creates a competitive advantage in their organization



COMPETITIVE ADVANTAGE FROM ANALYTICS LEVELS OFF

The percentage of companies gaining a competitive advantage from analytics in 2013 was smaller than in 2012.



THE NEED TO IMPROVE ANALYTICS

Making decisions solely with experience is losing its luster, as many companies recognize the need to broaden their use of analytics and pressure staff to become more data-driven. Fully 87% of managers believe their organizations need to step up their use of analytics.

Finding the Road Less Traveled

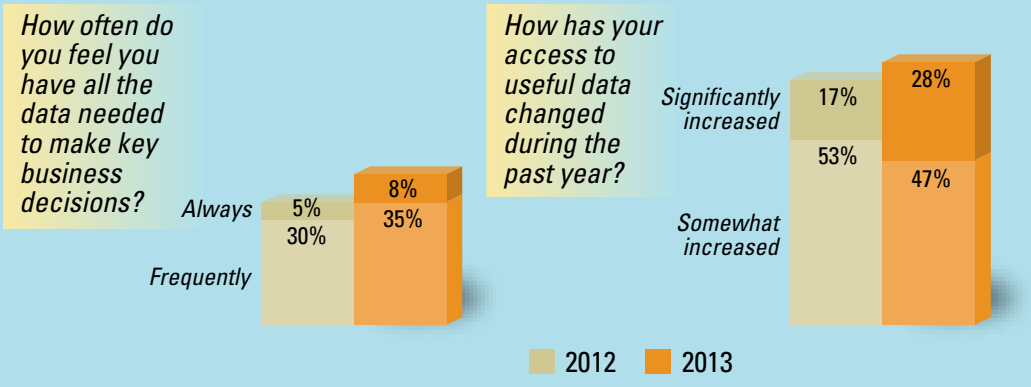
The challenge of finding and sustaining a competitive advantage with analytics seems to be weighing heavily on many decision makers. The vast majority of survey respondents, 87%, are calling for their organizations to step up the use of analytics. Many are frustrated with their organizations' reliance on management experience over data analysis. Some are feeling pressured by senior management to become more data-driven. They share a common restlessness to elevate their organizations to the next level of analytics. (See "The Need to Improve Analytics.")

With a desire to be more analytically focused, survey respondents report that access to useful information is increasing. This rise in data access is accompanied by a growth in the percent of respondents who feel they have all the data they need when making decisions. (See "More Managers Have the Data They Need.")

However, this is still the minority (43%), leaving many managers hungry for more relevancy, accurate and timely information. One reason: Despite better access to more useful data, improvements to data management skills are not keeping pace. Companies are making only marginal gains in their ability to manage information, and in the case of aggregating or integrating data, there are signs that some companies may be getting overwhelmed by data management challenges.[3] (See "Data Management Skills Slow to Improve.")

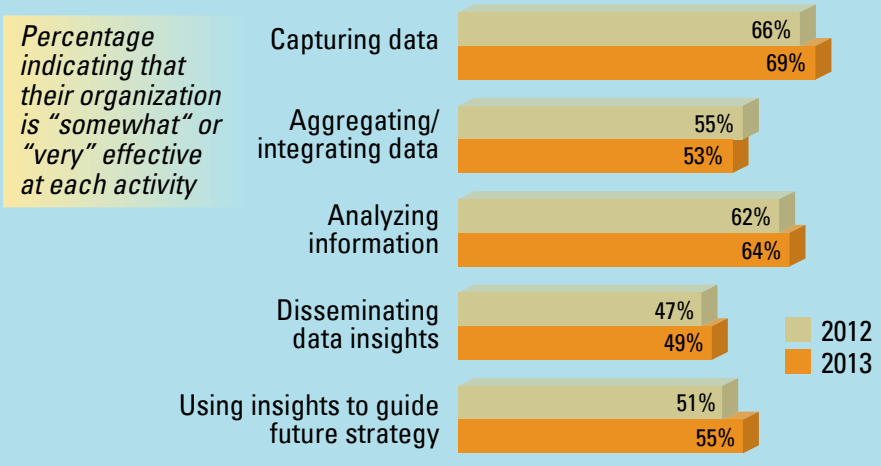
MORE MANAGERS HAVE THE DATA THEY NEED

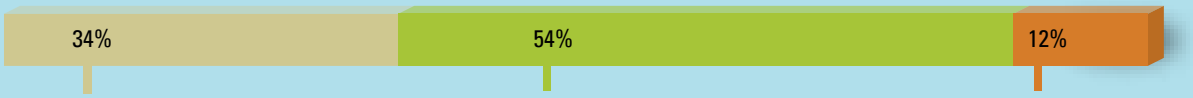
A jump in access to more useful data is helping managers make key decisions.



DATA MANAGEMENT SKILLS SLOW TO IMPROVE

The ability to manage information is developing slowly even though the pressure to use more data in decision-making is intense.

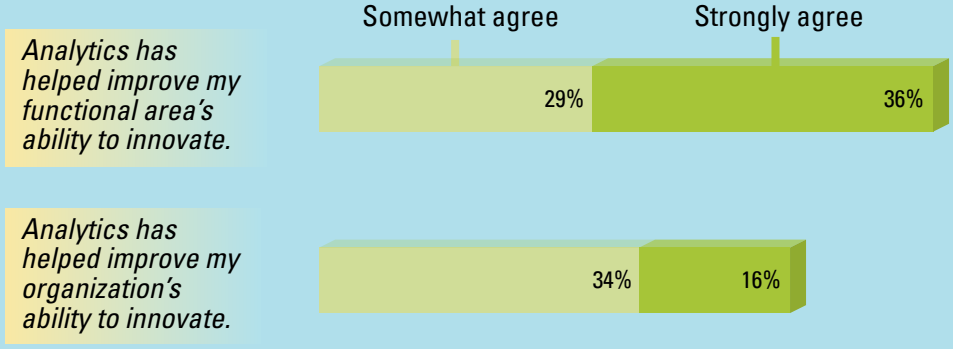




Analytically Challenged	Analytical Practitioners	Analytical Innovators
Rely more on management experience than data analysis	Working to become more data driven	Analytics culture driven by senior mandate
Focus on cost reduction in use of analytics	Primarily operation in their application of analytics	More strategic in their application of analytics
Suffer from data quality and access issues	Have "just good enough" data	Place a high value on data
Lack appropriate data management and analytical skills	Have more of the information they need to make decisions	Have higher levels of data management and analytic skills

THREE LEVELS OF ANALYTICAL ORGANIZATIONS

Respondents are at various levels of analytics sophistication.



POCKETS OF ANALYTICS INNOVATION

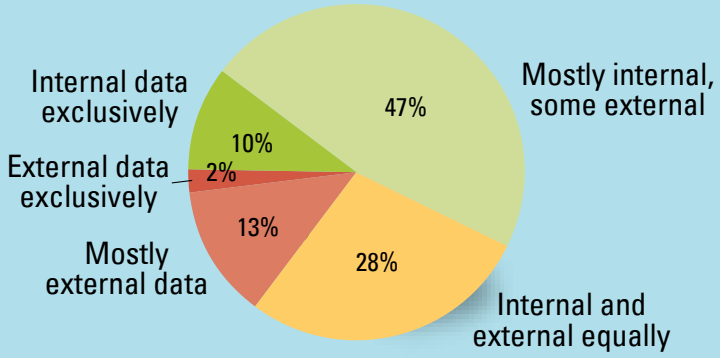
Innovating with analytics is happening in parts of companies, not as much across organizations.

CROSSING THE INNOVATION GAP

To find their own path, companies need to not only shore up their data management skills, but also, as Bank of America's Hague remarks, address the growing "innovation challenge." Pockets within organizations are finding ways to innovate with analytics, yet those abilities are not extending across organizations to the same extent (see "Pockets of Analytics Innovation"). This suggests that at the organizational level, analytics-based innovation remains an elusive target.

Organizations can be categorized by analytical outcomes as highlighted in the 2013 *MIT Sloan Management Review* and SAS Institute report, *From Value to Vision: Reimagining the Possible with Data and Analytics*.[4] Organizations that are most successful with analytics, the Analytical Innovators (see "Three Levels of Analytical Organizations") use analytics both to create a competitive advantage and to innovate. They tend to view data as a core asset, an important perspective as many organizations increasingly take on analytics projects that rely on external data created by partners, suppliers and even competitors. A key element of finding the sweet spot for competitive advantage is using the right data.

Which of the following best reflects your use of internal and external data for your big data inititatives?



BIG DATA PROJECTS MIX DATA

Most big data projects mix internal and external data.

CONTROL YOUR DATA DESTINY

As more companies seek new sources of information to gain a competitive edge, well-known data and analytics providers, from Google to American Express to Bloomberg, can't supply all the demand for valuable information. A variety of companies are stepping in to fill that gap, becoming data and analytics providers.

This shift is clear when considering big data projects, a growing source of IT expenditures among large companies. A 2013 survey of nearly 100 senior executives of Fortune 1000 companies reveals that 91% of these companies are investing in big data projects, up from 85% the year before.[5] Some 88% of respondents expect to be investing more than a million dollars in big data projects by 2016.[6]

Because big data projects almost always mix internal and external data (see "Big Data Projects Mix Data"), these increasingly common projects will heighten demand for data — if current trends continue — from a variety of sources. In the manufacturing sector, General Electric is helping companies conduct big data projects that integrate sensor data that anticipate product faults and identify maintenance issues. GE is spending a billion dollars and hiring hundreds of analysts to help create an industrial Internet built on sensor data and analytics.[7] It would be easy to see GE as an anomalous example of a single corporate titan moving into data services with resources that far exceed those of other companies.

But the reality is that many companies are changing their business models and becoming data providers, fueled by high levels of demand across industry sectors for more accurate and timely information.[8]

Consider Entravision Communications, a Spanish-language media company founded in 1996 in Santa Monica, California, which owns and/or operates more than 50 TV stations, 48 radio stations and other multimedia assets that reach most of the U.S. Hispanic consumer market.[9] In 2012, Entravision's senior management responded to industry shifts by investing in a big data initiative to boost ad revenues. The hope was that a new analytics platform would provide valuable insights into Latino consumption patterns, which the company could then use to help sell media spots to ad agencies.

To the company's surprise, customers found the insights generated by the new analytics platform so valuable that they wanted to buy the information outright, independent of their interest in buying media advertising. Christopher Young, Entravision's chief financial officer, explained the genesis of this approach to research:

> *Part of our job is to provide research that backs up the efficiencies of media buys: if you want to buy advertising in El Paso for auto dealerships, we offer research about why you should be buy-*

ing advertising on Spanish language media. We pay millions of dollars a year on this kind of research, about a half a million dollars goes to one company that sells us research based on samples, which isn't as good as research based on actual consumption data. Our research is now based on actual consumption data. At one point, we realized that we've got better data in house than what we've been buying from third-party research firms. How many other people are buying research from this third-party firm? They have no idea how much better our research is. We could sell our research to them right now. That's a whole new revenue stream we never gave any thought to, plus we can stop investing in research we don't need or that is of lower quality than we can now produce in house.

To create its big data offerings, Entravision is integrating 2,000 separate data points from about 300 different data sources, including its own. A spin-off created to sell these insights, Luminar Insights, is already close to breaking even, with an initial start-up cost of $1.5 million.

Similar opportunities are presenting themselves in other industries. Chicago-based StyleSeek, an online fashion recommendation platform, stumbled upon pent-up demand for better fashion customer data as it built its base of subscribers and partners. The company's novel recommendations are based on StyleDNA, an online questionnaire that asks consumers to select from different images in several categories ranging from stylish front doors to beverages.[10] Based on a consumer's choices, StyleSeek creates a profile and recommends apparel options from more than 200 retail partners, including Macy's, Nordstrom and J. Crew.

StyleSeek's business model is based on commissions it receives from retailer sales. Because StyleSeek's click-through conversion rates are up to 10 times higher than what other websites achieve, several of the company's retail partners are clamoring for a white-label version of StyleSeek's analytics platform that integrates their own transactional data. StyleSeek founder and CEO Tyler Spalding described this unexpected demand for big data:

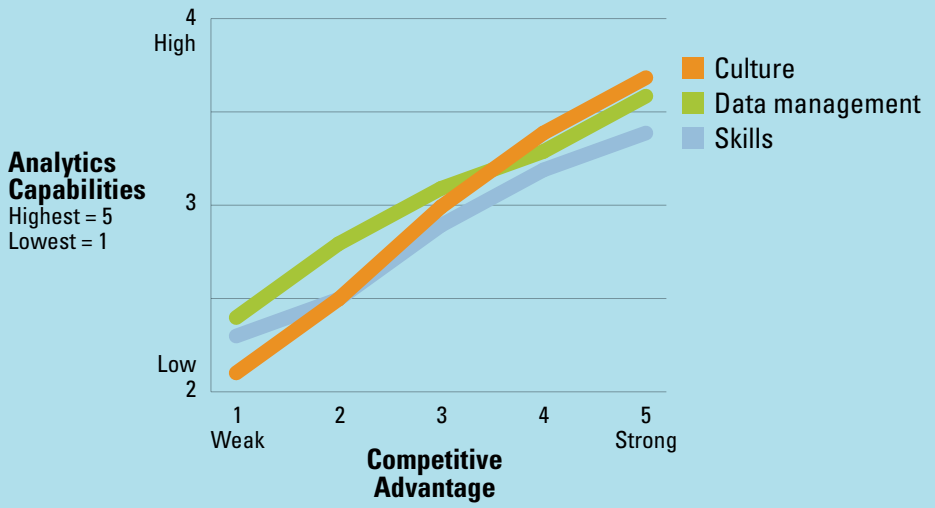
> *We can take our technology and put it on our partner sites [to help them get] a deeper understanding of what's happening with customers — what's working and why. A lot of our big retail partners have already said, "Sign us up for this immediately; we'll do whatever we need to get this working."*[11]

GE, Entravision and StyleSeek, three very different companies in different markets, are expanding the data pie for everyone to share. Their stories reflect the latent demand for better data and the new approaches companies are taking to meet this demand. The result is an increase in access to useful information for decision makers.

In this new data environment, it will become increasingly important for businesses to know where the data they use comes from, with whom it is being shared, whether they have access to the most valuable information and how others are using the same data they have access to. Competition *for* the right data might become as important as competition *with* data. Winning one without the other may not be enough to keep a company out in front.

Analytics Culture: The Bridge to Competitive Analytics

Some observers acknowledge the importance of culture as a "secret sauce" for creating business value with analytics.[12] Yet few analyses offer evidence



THE NEED FOR CULTURE

Outweighing other analytics factors, culture is the key factor that enables companies to achieve a competitive advantage with analytics.

that having an analytics culture has much to do with analytics success, and if it does, how that relates to having (or not having) skills and technology.[13]

"The Need for Culture" provides evidence that an advanced analytics culture outweighs other analytics-related factors, including data management technologies and skills, in companies that strongly agree they are gaining an advantage from analytics. Essentially, a strong analytics culture is the lynchpin in moving from competitive parity to competitive advantage. Nonetheless, an effective analytics culture is built on the backs of more advanced data management processes, technologies and talent. There is no analytics culture without the skills and talent to ensure that the data and insights are worth accessing and sharing. Together, analytics culture, data management processes and technologies and skills or talent are the main components of an organization's analytics capability. (See "Appendix: Key Dimensions of an Analytical Capability" on page 20 for the success factors behind the three dimensions of an analytics capability — culture, data management and skills.)

WHAT IS AN ANALYTICS CULTURE?

An analytics culture unites business and technology around a common goal through a specific set of behaviors, values, decision-making norms and outcomes. (See "Components of an Analytics Culture," page 11.) In some companies, well-meaning technologists who effectively manage data and skillfully deliver timely insights, for example, can be thwarted if decision-making norms don't encourage the use of analytics in decision making, especially if the data counters views held by senior management. In an analytics culture, that doesn't happen: decision-making norms, behaviors, values and outcomes are aligned to assure that analytical insights actually generate value, not merely promise the possibility.

A single company (especially a large, multinational company) may have different analytics cultures within the same organization. For example, one analytics manager at a professional sports team bemoaned the fact that the analytics group that dealt with players (talent recruitment and on-field performance analytics) received more funding and respect from senior executives than the analytics group that dealt with concessions and ticket sales, which is the group he was a part of. His experience was echoed by analytics managers in other companies we interviewed.

With many companies facing a skills gap just as they are being pressured to up their analytics game, collaboration has become an essential feature of an analytics culture. At the website RentTheRunway.com, every major project is managed by a cross-functional team

that includes product engineers and data analysts. To support the cross-functional teams up the ranks, product leaders for each team report into the C-Suite. The value of "a central model is necessary, but not sufficient," says Vijay Subramanian, RentTheRunway's chief analytics officer. "If analytics simply supports different functions, it will never get the voice it needs to change the company through data."

Collaborating with analytics is not the same as simply working with a central analytics group to receive an analytics service. At the health care company WellPoint, the IT and business sides of the organization worked hard to achieve unprecedented levels of collaboration to advance the strategic objectives of its Enhanced Personal Care program, a new provider payment system that relies on population health analytics. (See "WellPoint Sidebar," page 12.)

Many large organizations are expanding in-house analytics programs and "democratizing" data and analytics. We put "democratizing" in quotes because the term is, in one important respect, misleading. MillerCoors, for example, has created an Advisory Council to identify and prioritize projects that might benefit from analytics investments. That doesn't mean that each project gets an equal vote for access to analytics capabilities. At GE, departments and projects bid for the services of analytics groups, where the projects with the best chance of a successful outcome are funded. At a project level, access to analytics can be — and usually is — more meritocratic than democratic.[14]

Organizations with a well-developed analytics culture have a shared language about how to talk about data. Caesars Entertainment, with more than 50 casino and hotel properties around the world, has been developing a corporate-wide analytics culture for several years. A key facet of its approach has been to develop a shared language for how to measure the business from one location to another. "At a very basic level, giving all of the operations a uniform view of their business was not a small thing," says Ruben Sigala, senior vice president and chief analytics officer for Caesars. "I don't want to sound trivial about it, but having that exercise in getting everyone on board — because we also have regional presidents who are managing businesses across jurisdictions — and giving them a uniform platform against that was something that added immediate value. That's a pretty low bar, at least in concept, but in actuality, that does take a good amount of time."[15]

Department heads at Caesars are charged with developing and reporting on key operating metrics. They don't do this in a silo. Each department head worked with a client base to come to a consensus about the metrics that mattered. That exercise never goes away, says Sigala: "The business evolves and requires that you're continuously examining this." And Caesars actually formalizes this process of continu-

COMPONENTS OF AN ANALYTICS CULTURE

Behaviors

- Integration of information management and business analytics into strategy
- Promotion of analytics best practices, collaborative use of data across company lines
- Planned investments in analytics technology, new talent and training
- Pressure from senior management to become more data-driven and analytical

Values

- Data is treated as a core asset
- Analytics is a top-down mandate driven by executives

Decision-Making Norms

- Analytical insights guide future strategy
- Data analysis outweighs management experience when addressing key business issues
- Organizational openness to new ideas and approaches that challenge current practices

Outcomes

- Analytics changes the way business is conducted
- Analytics causes a power shift in the organization

SIDEBAR: WELLPOINT STRATEGY DRIVES CULTURE CHANGE

Under pressure to rein in costs without compromising quality of care, insurers are turning increasingly to analytics for a solution. Many insurers are using population health care analytics, which aggregates and analyzes insurance data to help providers better understand and serve their patient populations, to help improve patient outcomes and reducing costs.

WellPoint — the largest for-profit managed care organization within the Blue Cross Blue Shield umbrella — is a case in point. An important component of WellPoint's strategy is to use analytics to change how it pays providers. WellPoint is shifting from a model where it pays physicians based on volume (procedures, visits, admissions) to one where doctors are paid based on "value" (ability to manage costs, improve patient outcomes and quality of care).

To make that model work, WellPoint intends to share insurance data with physicians to create a 360-degree medical view of every patient, enabling providers to spot patients likely to go to the emergency room or be readmitted to a hospital, expenses that contribute to the high cost of health care delivery.

Sharing insurance data with physicians became a significant organizational challenge, requiring data integration across numerous regional health plans that did not share a common language for defining key data points and assuring physicians that WellPoint was a trustworthy partner willing to share cost savings. A short term goal was to create a few Excel-based reports covering five key data points:

1. list of the physician's total patient population
2. list of patients with gaps in care
3. list of patients visiting the emergency room
4. list of patients admitted to the hospital highlighting those at high risk for readmission
5. list of high-risk patients to focus on with actionable information around their risk drivers

Within WellPoint, creating these reports became a classic showdown between IT and interests from the business side. When the IT team delivered its first report several months late, Ariel Bayewitz, the manager in charge of the analytics program, was stunned — it didn't actually work in Excel. True, the report could be downloaded, but it couldn't be sorted. "It might as well be a PDF," he had thought to himself.

The point was to give physicians content they could do something with. If they couldn't sort it, they couldn't figure out which patients would benefit most from their help. The first three reports all had problems. For instance, different units within the company reported an emergency room visit in different ways. The IT team's explanation: no one told it the definitions had to be the same. That much was true — the business side didn't think it should have to specify that emergency room visits be consistent across reports.

The high-profile project was subsequently placed in Red status, and senior management got involved. Problems were escalated to executives who ensured resources were allocated. Outside consultants were hired. Experts were hired. More resources were diverted to the project. And, after many challenging discussions, IT and the business began to work together using an iterative development approach, called "Agile", which focused on "user stories" over requirements.

In short, to create strategic benefits with analytics WellPoint had to change its organizational behavior. Without an effective collaboration between the business side and IT, the program would have remained in jeopardy. Without leadership's involvement, the program would have remained in jeopardy. Preparing data for a strategic role often means changing business conduct and that, more often than not, requires a top down process to create the necessary alignment of incentives and goals.

ous change. Each area of the organization has innovation outlines attached to their strategic plan for the coming year.

Development of an effective analytics culture requires a change in how companies think and operate. To make that kind of transition, senior management pressure is critical. Companies with a top-down mandate for fact-driven decision making for all employees are experiencing gains with analytics to a far greater extent than other organizations.

Senior management at State Street, a Boston-based financial services firm for institutional clients that is the second oldest bank in the United States (222 years old), recognized that its clients faced new challenges that would require new services in the aftermath of the 2009 global financial crisis. In response, State Street Global Exchange (SSGX) was established in 2013. The new business — there are only four separate businesses at State Street — focuses on four key areas: big data, information and insights, investment analytics and electronic trading. With assets pulled from nearly every corner of the bank and a staff of nearly 900, the goal of SSGX is to help clients create strategic insights from their access to unprecedented varieties and volumes of data and apply these insights to investment decisions executed on neutral electronic trading platforms operated by the bank.

"You have to continue to adapt to thrive. This is one of those places where we're adapting," says J.R. Lowry, senior vice president and chief operating officer of SSGX. "It's a little bit like a post-merger integration in what we're pulling together." Indeed, creating a nimble business culture that would be responsive to clients in new ways and also position State Street to compete directly with existing competitors and small analytics start-ups has been a learning process.

To make sure everything stays on track, the team takes a quarterly pulse check through a survey released to various groups within SSGX. The questions deal with, for example, how well the business is minimizing bureaucracy, focusing on client needs or enabling people to work collaboratively. The goal is to implement change based on the survey results before the next survey is rolled out. At the same time, Lowry says, there are other cultural factors that come into play: executive support, leading by example and evangelizing "a lot of little wins." And then there's just the sheer moxie that comes with being a startup in the midst of a big company. "To some extent, we feel like we have a bit of a obligation to shake things up a bit," says Lowry. "That's probably one of the big things that the leadership team thinks about almost every day: how hard we push people to change, and how we pull them along."

Five Fundamental Questions

As companies and the markets they operate in have become more complex, many leaders are recognizing the importance of asking the right questions. Avinoam Nowogrodski, CEO of Clarizen, a project management software company, is one of these leaders:

> *"The level of uncertainty and the dynamic of everything that happens around us is requiring leaders to change their style — to move from command and control to sense and respond. I think that real leadership is about asking the right questions."*[16]

Given that many companies, and many leaders, are seeking a competitive edge with analytics, what questions do they need to ask?

It turns out that innovation is crucial to understanding how companies are using analytics to create substantial business value. The Analytical Innovators' answers to five straightforward questions offer a roadmap for how to build analytics programs that will continually innovate and help

keep their companies ahead of the competition. These questions are:

1. Is my organization open to new ideas that challenge current practice?
2. Does my organization view data as a core asset?
3. Is senior management driving the organization to become more data-driven and analytical?
4. Is my organization using analytical insights to guide strategy?
5. Are we willing to let analytics help change the way we do business?

These five questions follow a natural progression. If a company is not open to new ideas, it won't be receptive to counterintuitive ideas that can address the discontinuous change some market shifts require. Even if it is open to new ideas, data won't impact strategy unless senior management views its company's data assets and analytics skills as an important source of value.

One mark of whether senior managers are viewing data and analytics as a core asset is whether they are, in fact, using analytical insights to guide strategy (whether on the creation or execution side, or both). The lesson from Analytical Innovators is that sustaining excellence with analytics demands continued senior management pressure, continuing investments in an analytics capability and a willingness to change the way the company does business — the execution side of being open to new ideas.

ANALYTICAL INNOVATORS RESPOND

The rest of this section explains how Analytical Innovators answer the five questions above and how their answers differ from other groups. In addition, this section offers concrete answers to each question that suggest how companies can use these questions to guide their own corporate agendas.

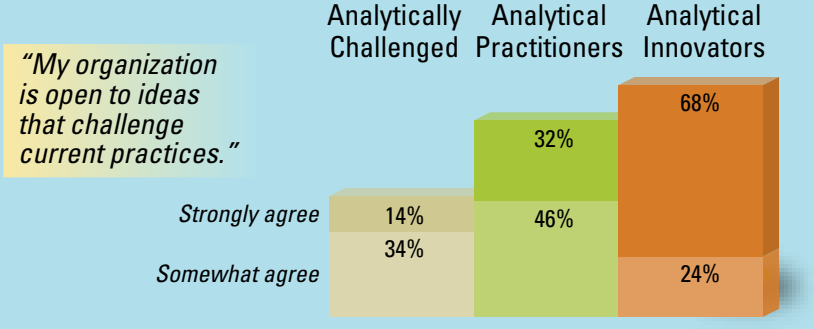
1 Is my organization open to new ideas that challenge current practice?

According to our survey data, more than 90% of Analytical Innovator organizations are open to ideas that challenge the status quo — far more than the other groups. This is especially true for those who *strongly* agree that their organizations are open to new ideas; two-thirds of analytical innovators put themselves in this category, compared to less than one-third of Analytics Practitioners. (See "Be Open to New Ideas.")

Shifting from current practices can mean challenging individuals' experiences, the basis of their authority and expertise, and introducing different approaches from what has worked in the past. Oberweis, a 99-year-old, family-run dairy business based in Ohio, began making this shift in 2012 as executives deliberated how to expand midwestern operations to the east coast. Historically, regional expansions had involved gathering operations executives, the people who manage the company's trucks and transfer centers, to figure out the best configuration for these resources.

BE OPEN TO NEW IDEAS

Analytical Innovators strongly agree that their organizations are open to new ideas at twice the levels (or more) of any other group.



This time, Bruce Bedford, vice president of marketing analytics and consumer insights, participated in the discussion. He had been brought on board in 2009 to inject some analytical thinking into the family-run company, and had discovered that the company's best customers were not the high-income, BMW-driving customers the operations executives thought. As he dug deeper into the data, Bedford began to discern the family profile that would most likely purchase high-end dairy products; it was a profile that did not include BMW drivers.

Bedford took the team through his analysis of Oberweis's target customer segments using data sets about community-level demographic information, and essentially convinced the group to re-examine its target market, and focus on the new family profile he had developed. Oberweis's expansion plans were then guided by this new model. More importantly, Bedford says, the company's decision makers began thinking about using data analytics within their own areas of expertise:

> *I've started to see people now say, "Wait a second, you know what, this analytics stuff, there's some power here, and maybe I should take the time to learn a little bit more about what Bruce is doing that maybe I could do." They're saying, "I'm not sure what I should be asking about, but let me at least ask if there's something that I* should *ask about."*

> *It comes down to having a number of people who don't ordinarily use analytics stop and see the lightbulb go off. The change is cultural, and to a point now where people want to acquire a better understanding of analytics tools because they can see that there is real benefit.*[17]

2 Does my organization view data as a core asset?

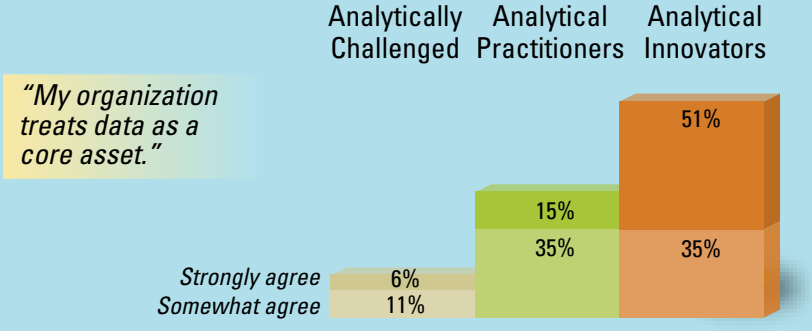
The transition from seeing data and analytics as something useful beyond basic financial reporting is one step, and companies that are more competitive and innovative with analytics tend to treat data very differently, as a core asset. Slightly more than half of Analytical Innovators in our survey strongly believe that their organizations treat data as a core asset. Analytics Practitioners and Analytically Challenged are farther behind, suggesting that significant change management is often required to treat data as a core asset. (See "Treat Data as a Core Asset.")

Entravision, StyleSeek and State Street suggest the range of companies in different industries (media, retail and financial services) that have come to view their data as a core asset, as an important resource that they can use to create value with their partners. Even participants in the less visible corners of industry are coming to view the latent demand for more valuable data as a reason to look anew at the importance of their own data.

PrintFleet, a small Canadian software provider to companies in the printer supply and copier value chain, is a perfect example. It collects data from most print manufacturers (Epson, Kyocera, etc.) to help end-users better control supply inventory and keep machines in operation. When Chris McFarlane took the company's reins in 2009, he saw the opportunity to use the data gathered from these devices on a broader scale. One of these ideas was to aggregate the data and provide it to major research firms, such as InfoTrends and Photizo. Another idea was to create an offering that connects dealers, resellers and others in the

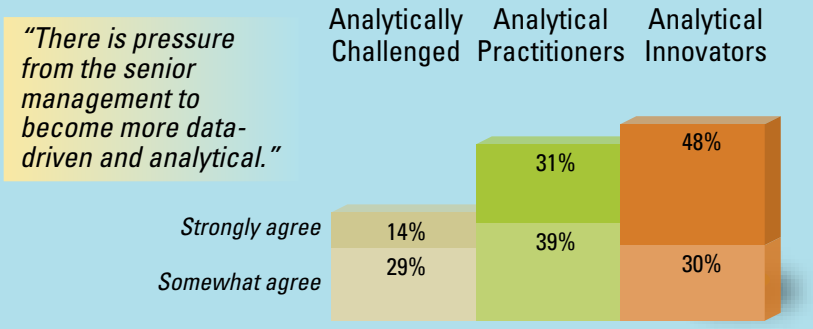
TREAT DATA AS A CORE ASSET

Analytical Innovators strongly agree that their organizations treat data as a core asset at three times the rate of Analytics Practitioners.



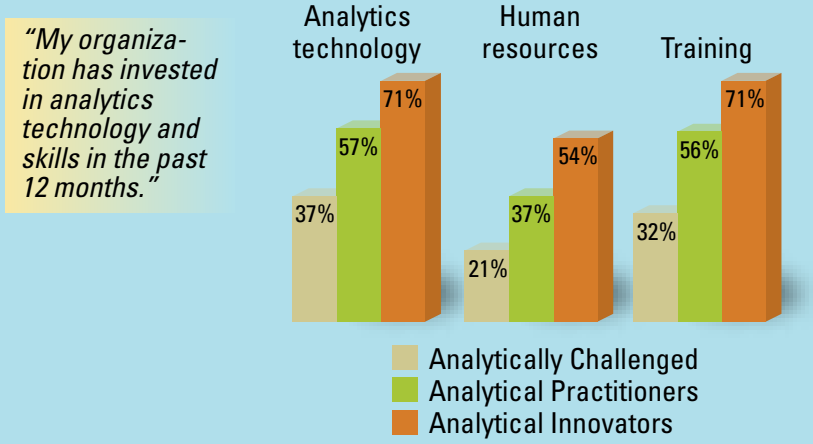
ANALYTICS NEEDS TOP LEVEL SUPPORT

Analytical Innovators keep up the pressure on staff to become even more fact-driven.



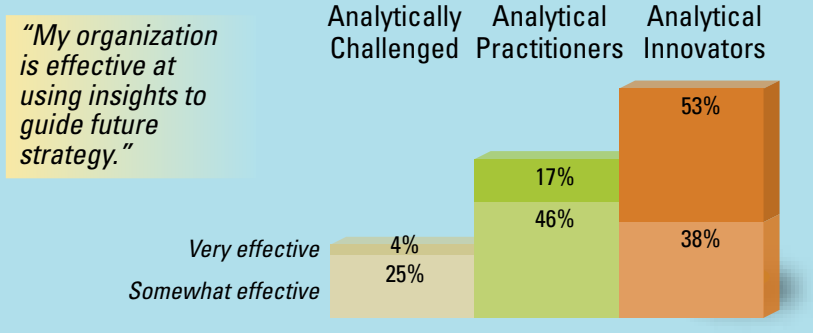
INVESTMENT: THE PRECURSOR TO ANALYTICS SUCCESS

Analytical Innovators are most likely to invest in analytics.



USE ANALYTICS TO GUIDE STRATEGY

Using analytics to guide strategy is one of the strongest markers of analytics success.



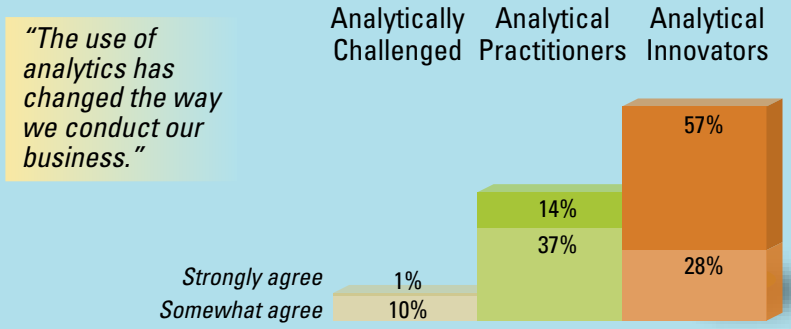
printer supply value chain, enabling participants to share data and improve their collective service to end-users.

3 Is senior management pushing the organization to become more data-driven and analytical?

To fulfill their analytics mandate, many companies are beginning to address an analytics talent shortfall and managers' propensity to trust (their) intuition over facts. Many companies are not waiting to hire graduates from new university degree programs designed to produce managers with data expertise (or data scientists with business expertise). Nor are they allowing managers to set their own pace in adopting more fact-based approaches to decision making. They are applying management pressure today to shift decision-making norms, and encouraging collaborations that combine expertise from analytics groups and business managers.

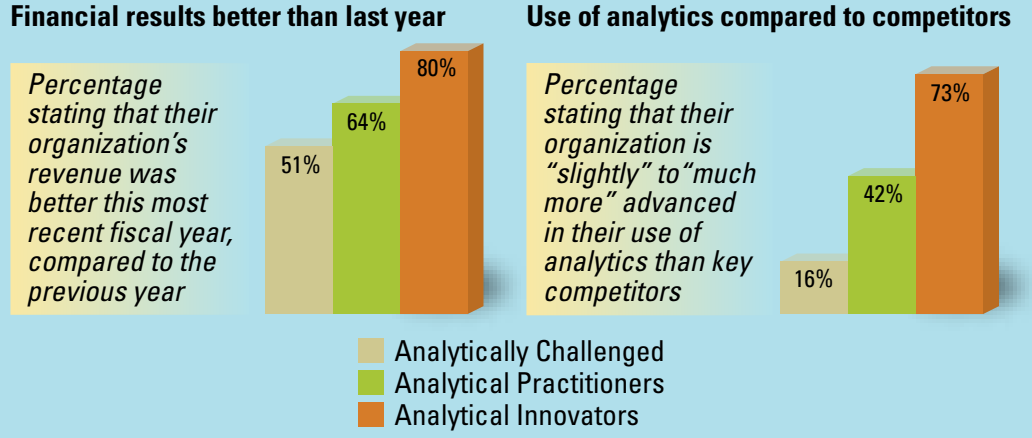
Senior management pressure to become more data-driven actually intensifies the more successful an organization is with analytics: Analytical Innovators are most likely to report senior management pressure to become more data-driven, even though this group is already succeeding with their analytics programs (relative to the other survey groups). (See "Analytics Needs Top Level Support.") Analytical Innovators do not rest on their analytics laurels. Almost four out of five Analytical Innovators agree that senior management puts pressure on the organization to become more data-driven and analytical. The pressure to become more data-driven is a behavioral norm for this advanced group.

Specifically, senior leadership can visibly commit to the value of becoming more data-driven by demanding more fact-based decision making of themselves and others and by investing in analytical capabilities. Analytical Innovators'



ANALYTICS CHANGES BUSINESS CONDUCT

Analytical Innovators are four times more likely than Analytics Practitioners to change their business operations as a result of analytics.



ADVANCED USERS REPORT BETTER FINANCIAL PERFORMANCE

Analytical Innovators are more likely to report better financial performance than other groups.

investments in analytics technologies, skills and training outpace the other groups in all three areas by a wide margin. (See "Investment: The Precursor to Analytics Success," page 16.)

During the early part of the last decade, with high growth in home improvement industry, Lowe's, the North Carolina-based home improvement retailer, used analytics to help determine its store expansion plans. During the recession and housing downturn, consumers began making more strategic decisions about what to improve, and in turn, what to buy. At the same time, customers began to expect from home improvement retailers a unified experience between their online and offline marketing channels. As a result, Lowe's shifted its business model and began using data in a whole new way. According to Kelly Ross, Lowe's senior vice president of Finance, Measure & Evaluate:

> *Our senior leadership team has decades of home improvement retail experience, in many cases learning the business from the ground up. But the retail landscape continues to change. The Internet, mobile and social media has created not only new ways to interact with customers, but is simultaneously creating an explosion of data. As a result, our business model has changed from a traditional retailer that drives growth through store expansion alone to an omni-channel home improvement company to help customers manage and enjoy their homes.*
>
> *As Lowe's has adjusted to this changing environment, there are two company efforts relevant to*

our discussion of decision-making and managing data for strategic insight. First, we've explored what it means to be a fact-based decision-driven company. Our leadership training has included methods of inquiry and exposure to the biases and behaviors that get in the way of critical analyses. Secondly, we are investing in new capabilities and creating metrics to understand customers and the market. New data, without the proper context and strategic framework, does not add much without prioritizing your information needs and a mental framework for real learning.

4 Is my organization using analytical insights to guide strategy?

There are at least three ways analytics can help guide strategy. One way is to forecast trends and shape how a company will strategically respond to market shifts. Another is to use analytics to help execute a company's strategy. A third way combines the first two: use analytics to shape both strategy and its execution. None of these is an easy thing to achieve.

According to our survey, 91% of Analytical Innovators are *effective* at using insights to guide future strategy — a far higher percentage than the other groups. This suggests just how difficult it is to use analytics in a strategic role without an analytics culture to support it. Even for Analytical Innovators, only 53% rate themselves as *very effective* at using insights to guide future strategy. (See "Use Analytics to Guide Strategy," page 16.)

The case of WellPoint, a health care insurer within the Blue Cross Blue Shield umbrella, illustrates the challenges that confront a company prepared to give analytics a leading role in executing strategy without having an analytics culture to support that role.

WellPoint developed a strategy to change its physician payment system by providing a wide range of insurance data to health care providers, who could then use the information to spot at-risk patients, improve health outcomes and reduce costs. WellPoint's strategy depended on providing physicians with information that would be easy to use, accurate and valuable. To execute this strategy, WellPoint relied on a cross-functional team to aggregate the data and deliver reports to providers. The company's IT department, however, had neither the experience of building analytics platforms for use by external constituents nor the experience of working on a strategically important project with strict deadlines. It also hadn't worked collaboratively in real-time with the business side of the organization.

This strategic use of analytics meant that the IT department's working approach to product development could not be business-as-usual. They weren't simply being order-takers as on past projects. They had been catapulted to a more high-profile role that required meeting strategic priorities, not just project requirements. That meant a different kind of collaboration with the organization's business side, and that required a transformational change in work processes and organizational culture. In the case of WellPoint, giving analytics a strategic role changed how business was conducted.

5 Are we willing to let analytics help change the way we do business?

Many of the examples discussed in this report describe companies in which data and analytics have played a role in changing business conduct (to varying degrees): Entravision, WellPoint, StyleSeek, PrintFleet, Oberweis, Lowe's and GE. These companies have had to change the way they operate either as a result of using data and analytics in strategic roles or in order to use them at all.

Both Analytics Practitioners and Analytical Innovators are recognizing the influence of analytics on their organizations, with more than 50% in both groups agreeing that analytics has changed the way their company conducts business. The disparity between the Analytical Innovators and the other groups, however, is most vivid when looking at those who *strongly agree* with that statement. Analytical Innovators are four times more likely to *strongly agree*

that analytics has changed the way their organizations conduct business than Analytics Practitioners. (See "Analytics Changes Business Conduct," page 17.) These transformational uses of analytics translate into better financial results. (See "Advanced Users Report Better Financial Performance," page 17.)

Conclusion

Analytics has become a common path to value. More important, the sweeping advance of analytics into industry practices is challenging organizations to step up their use of analytics, whether they are just getting started or are seasoned practitioners — and not merely because more companies are viewing analytics as an opportunity to generate value. Organizations that are successful with analytics continue to invest in their analytical skills and technology to stay ahead of the curve. But perhaps the key point is that they foster the right analytics culture, are open to new ways of thinking and change the way they do business. Achieving and sustaining competitive momentum is hard work. Ask Nate Silver.

REFERENCES

1. The Daily Show: http://thedailyshow.cc.com/videos/2eeb6q/nate-silver, November 7, 2012.

2. Dan Vesset, Ashish Nadkarni, "Worldwide Business Analytics Technology and Services 2013–2017 Forecast," IDC Report, December 2013.

3. There are several possible reasons for this backward movement. Organizations may be trying to do too much with data or the amount, variety or speed of the data could be overwhelming.

4. David Kiron, Pamela Kirk Prentice and Renee Boucher Ferguson, "From Value to Vision, Reimagining the Possible with Data and Analytics," MIT Sloan Management Review, March 5, 2013, http://sloanreview.mit.edu/reports/analytics-innovation/

5. NewVantage Partners, Big Data Executive Survey 2013: The State of Big Data in the Large Corporate World, September 9, 2013. See also Renee Boucher Ferguson's discussion of the survey in her blog, http://sloanreview.mit.edu/article/how-big-data-is-influencing-big-companies/

6. Ibid.

7. Tim Catts, GE's Billion-dollar Bet on Big Data, Businessweek April 26, 2012. See: http://www.businessweek.com/articles/2012-04-26/ges-billion-dollar-bet-on-big-data

8. Additional evidence of this trend can be found in Tata Consulting Services, The Emerging Big Returns on Big Data, 2013. See: http://www.tcs.com/SiteCollectionDocuments/Trends_Study/TCS-Big-Data-Global-Trend-Study-2013.pdf

9. Entravision's story is discussed in more detail in an MIT Sloan Management Review case study called Luminar Insights. See http://sloanreview.mit.edu/projects/luminar-insights/

10. This example is discussed in more detail in David Kiron, Pamela Kirk Prentice and Renee Boucher Ferguson, "Raising the Bar with Analytics," MIT Sloan Management Review, Winter 2014, pp. 29-33.

11. David Kiron, Pamela Kirk Prentice and Renee Boucher Ferguson, "Raising the Bar with Analytics," MIT Sloan Management Review, Winter 2014, pp. 29-33. Quote is on p. 29.

12. Accenture: Analytics Culture: The Secret to Success, 2011, http:..www.accenture.com/SiteCollectionDocuments/PDF/Accenture_Analytics_Culture_The_Secret_to_Success.pdf

13. One exception is "Analytics: The widening divide: How companies are achieving competitive through analytics," David Kiron, Rebecca Shockley, Nina Kruschwitz, Glenn Finch and Dr. Michael Haydock. MIT Sloan Management Review Research Report, Fall 2011.

14. Having an analytics culture does not require that all business questions addressed with analytics utilize in-house skills and technology. Analytics outsourcing is a growing trend that may be an option for certain business issues, whether companies have sophisticated or unsophisticated analytics capabilities. One limiting factor in these relationships, though, is outsourcing the analysis of strategically valuable data. A recent article on this topic in MIT Sloan Management Review quoted an analytics BPO manager: "We know we can add a lot more value to our customer's analytics program if they came to us with a more strategic outsourcing arrangement, where we could be responsible for a certain aspect of their competitive analytics program that our capabilities have shown to be superior. If we suggest this to our customers, they usually become threatened, and this can put the overall relationship at risk." From David Fogarty and Peter C. Bell, "Should You Outsource Analytics," MIT Sloan Management Review, Winter 2014, pp. 41-45.

15. Renee Boucher Ferguson, "A Process of Continuous Innovation: Centralizing Analytics at Caesars," July 30, 2013. http://sloanreview.mit.edu/article/a-process-of-continuous-innovation-centralizing-analytics-at-caesars/

16. Adam Bryant, "Avinonoam Nowogrodski of Clarizen, on the Rewards of Listening," New York Times, March 13, 2014, http://www.nytimes.com/2014/03/14/business/avinoam-nowogrodski-of-clarizen-on-the-rewards-of-listening.html

17. This quote first appeared in David Kiron, Pamela Kirk Prentice and Renee Boucher Ferguson, "From Value to Vision, Reimagining the Possible with Data and Analytics," MIT Sloan Management Review, March 5, 2013. Quote is on p. 5.

Appendix

This Appendix lists statements that collectively define an analytics capability. The statements in the second column originally appeared in the survey as questions. For example, the statement "access to useful data has improved during the past year" appeared in the survey as "How has your access to useful data changed during the past year?"

KEY DIMENSIONS OF AN ANALYTICS CAPABILITY	RELATED SURVEY COMPONENTS
CULTURE	
	Integration of information management and business analytics into strategy
	Promotion of analytics best practices
	Collaborative use of data across company lines
	Planned investments in analytics technology, new talent and training
	Pressure from senior management to become more data-driven and analytical
	Data is treated as a core asset
	Analytics is a top-down mandate
	Analytical insights guide future strategy
	Data analysis outweighs management experience when addressing key business issues
	Organizational openness to new ideas and approaches that challenge current practices
	Analytics changes the way business is conducted
	Analytics causes a power shift in the organization
DATA MANAGEMENT	
	Managers have all the data they need to make key business decisions
	Customer-facing employees have access to insights to help drive sales and productivity
	Access to useful data has improved during the past year
	The organization is effective at capturing data, cleaning data, aggregating/integrating data and visualizing data
	Data is shared across functional silos and/or business units
	The organization uses a great deal of the data it generates or collects.
	Functional areas are planning to make investments in analytics technology in the next 12 months, and/or have already made investments in the past 12 months.
	Analytics is being applied to key business issues by the organization as a whole.
SKILLS	
	The organization as a whole is effective at analyzing information and disseminating data insights
	The organization has the appropriate analytical talent to make good use of analytics
	Executives are effective at balancing analytics and intuition
	Individual managers feel adequately prepared to use the organization's data to address business issues
	Functional areas have made investments in the past 12 months and are planning to make investments in the next 12 months in analytics-related human resources (hiring analytics talent such as data scientists or analysts) and training (expanding analytical skill sets of current employees)

ACKNOWLEDGEMENTS

Zachery Anderson, Vice President, Marketing Science and Analytics, Electronic Arts Incorporated

Justin Borgman, CEO, Hadapt

Catherine Bottrill, CEO and Co-founder, Pilio Ltd.

Yan Chow, Director, Innovation & Advanced Technology Group, Kaiser Permanente Information Technology

Paul Eykamp, Data Scientist, AAA Northern California, Nevada and Utah

Lucas Fontenelle, Senior Scientist, Halliburton Company

Jeffrey Gates, Partner, The Aquitaine Group

Hjalmar Gislason, Founder and CEO, DataMarket Inc.

Matthew Grace, Chief Technology Officer, Objective Logistics

Shawn Hanna, Managing Partner, Retail Scientifics

Douglas Hague, Chief Analytics Officer, Bank of America Merchant Services

Suzhou Huang, Director, Research & Development, Global Analytics, Ford Motor Credit Company

Justin Kendig, Information and Analysis Supervisor, Caterpillar Incorporated

Philip Kim, (former) Marketing Operations Leader, Measurement & Control, General Electric

Jared Lawrence, Vice President, Revenue Services, Duke Energy Corporation

JR Lowry, Senior Vice President and Chief Operating Officer, State Street Global Exchange, State Street Corporation

J. Chris McFarlane, President & CEO, PrintFleet Incorporated

Franklin Rios, President, Luminar Insights, a unit of Entravision Communications Corporation

Kelly Ross, Senior Vice President Finance, Measure and Evaluate, Lowe's Companies

David Russo, Program Integration Control and Coordination Manager, Raytheon Company

Rob Saker, BIS Analytics Lead, Business Transformation, MillerCoors LLC, a joint venture of SABMiller and Molson Coors Brewing Company

Anna Smith, Analytics Engineer, RentTheRunway

Vijay Subramanian, Chief Analytics Officer, RentTheRunway

Ali Tinazli, Director, Head of Business Development and Sales, Sony DADC BioSciences

Ruben Sigala, Senior Vice President & Chief Analytics Officer, Caesars Entertainment

Tyler Spalding, Co-founder and CEO, StyleSeek

Dexter Wood, Senior Vice President and Global Head of Business & Investment Analytics, Hilton Worldwide

Jill Hummel, Vice President of Payment Innovation, WellPoint

Art Fitts, Consultant, Deloitte

Michael Fitzgerald, Contributing Editor, MIT Sloan Management Review

Reprint 55480.