



# Big Data Doesn't Make Decisions, Leaders Do

The six steps to build organizational muscle in analytics

By **Florian Zettelmeyer** and **Matthias Bolling**

KELLOGG INITIATIVES Markets and Customers

# Big Data Doesn't Make Decisions, Leaders Do

The six steps to build organizational muscle in analytics

By **Florian Zettelmeyer** and **Matthias Bolling**

**B**ig data isn't a data science problem. It's a leadership problem. Leaders who've solved it are building new business and operating models, sparking disruptive innovation, and changing the terms of competition in their industries. How? To find out, we talked to senior executives who are leading the way in making data analytics part of the DNA of their organizations. From these discussions, six principles emerged that can help jumpstart any organization's effort to build organizational muscle in analytics.

## Recognizing the Real Challenge of Big Data

The story of baseball manager Billy Beane is widely familiar, thanks to Michael Lewis's bestselling book *Moneyball* and Brad Pitt's portrayal in the movie of the same name. But it is almost as widely misunderstood. To many executives, the *Moneyball* story heralds the era of big data, the era in which organizations that are not driven by data and analytics will lose out to those that are.

It is true that data and analytics play a big role in the *Moneyball* story. In 2002, the Oakland A's had one of the smallest budgets for player salaries of any team in baseball. Frustrated at his inability to outbid other teams for good players, Beane turned for help to Paul DePodesta, a former economics major at Harvard who was skilled in analytics and familiar with baseball statistics. By mining years of data on hundreds of individual players, the two discovered statistics that were predictive of how many runs a player scored, but weren't statistics that were traditionally valued by baseball scouts. Beane realized that this meant that players who ranked highly on these statistics were likely to be undervalued by the market. He began looking for player bargains — players whose stats suggested they would score runs, but who were under the radar of other teams. As Beane began to acquire such players, the A's started to win, often beating teams with much bigger salary budgets.

But interpreting this as a story baseball's "big data moment" misses its key message for executives. None of the big data elements of the *Moneyball* story were new arrivals in 2002. Detailed data on baseball players have been available since the 1800s. The regression analysis used by the Oakland A's a 150-year-old technique which could have been implemented with 1980s computer power. Even the idea of applying analytics to baseball wasn't new: Bill James, who called his approach "sabermetrics," has been writing about data analytics in baseball since 1977.

What was new in 2002 was that a leader — Billy Beane — had the courage to use the insights gleaned from data analytics to drive the way he ran his business. It took courage both because what the analytics said went against the conventional wisdom of how to run a successful baseball team and because Beane had to overcome a lot of reluctance inside the organization to change their approach. The reason "moneyball" succeeded for the Oakland A's was not because of the success of the data analytics themselves, but because

of the success of the leader in understanding the potential of analytics for his business and in changing the organization so that it could deliver on that potential.

Just as they misunderstand *Moneyball*, many executives misunderstand they key to transforming into an analytics-driven organization. Too often, analytics is seen as a problem in data science and technology. Certainly, an analytics capability requires investment in big data technology, infrastructure, and data scientists. But putting analytics to work for the business is a leadership problem, not the domain of specialists. You cannot simply hire a roomful of data scientists and hope to get far — they cannot leverage analytics in a vacuum. Instead, as we argue below, an understanding of analytics must become part of the repertoire of all leaders and managers, ultimately becoming part of the DNA of the entire organization.

## Jumpstarting Your Organization's Capabilities

There is no one-size-fits-all blueprint for creating organizational muscle in analytics. That said, there are six guiding principles that run through the experiences of senior leaders who have wrestled with the challenge:

1. Analytics should start with business problems.
2. Analytics needs translators.
3. Analytics requires data scientists of different flavors.
4. The analytics team should help get the job done.
5. All leaders need a working knowledge of data science.
6. Analytics should have a seat at the top table.

In a series of in-depth conversations and roundtable discussions, senior leaders made the case that these six principles accelerate a firm's organizational capabilities in analytics.

## 1. ANALYTICS SHOULD START WITH BUSINESS PROBLEMS.

Data that are created incidentally in the course of business are often good for little other than solving the problems they were collected for in the first place. And simply amassing data and sifting through them to see what might emerge is little better. “We had this impossible problem of data because there was so much

---

**We started collecting call records details and created this gigantic dataset and said ‘Let’s find some insights from this.’**

---

user interaction,” told us the vice president for product management and design for a leading provider of video conferencing. “We started collecting call record details and created this gigantic dataset and said ‘Let’s find some insights from this.’ It became an interminable data manipulation exercise and it didn’t result in much.”

The way to get around the pointless assemblage is to look for business problems that need to be solved. Having identified business problems helps leaders answer key questions around analytics:

- What existing data are useful and what needs to be collected?
- What changes must be made to processes and incentives in order to make data collection possible?
- What analytics infrastructure should be put in place?

Consider customer churn, an expensive problem in many industries, as the cost of acquiring a customer is usually much higher than the cost of keeping one. “In our business,” told us the head of analytics for a software service

provider, “by the time the customer drops you it’s over.” When the data team was asked to predict which customers were likeliest to drop their service, it quickly became apparent that existing data were insufficient. But, with the problem squarely in mind, the team decided to tap into its customers’ social media feeds. By combining these new data with existing call center data, they detected a word-frequency

pattern that could predict, with high accuracy, whether a customer would drop. This knowledge allowed them to offer likely defectors the best possible customer support, dramatically reducing churn.

## 2. ANALYTICS NEEDS TRANSLATORS.

Managers do not always have a sense of what analytics can do for them, and data scientists often lack domain expertise and an understanding of a manager’s business problems to be helpful. For this reason, one leading insurance provider has found it useful to rely on intermediaries: typically qualitatively oriented MBAs with a strong analytics bent who can facilitate conversations between business managers and data scientists. Says the company’s chief analytics officer, “They are very strong at pattern recognition; they connect the dots in new ways, and as translators they are incredibly talented.”

Translators are often found inside the company, but they can also be third parties. For example, Dunnhumby, a global customer science company, performs the translator role for Kroger in the U.S. and Tesco in the U.K. Dunnhumby has a sales team that works directly with the client, as well as a team of data scientists. But essentially, there is also a group of business analysts who serve as translators. These business analysts help their colleagues in sales to formulate business problems that

can be answered with data, work with data scientists to perform the requisite analyses, and then return to the sales team to assist with interpreting and communicating the reports.

### 3. ANALYTICS REQUIRES DATA SCIENTISTS OF DIFFERENT FLAVORS.

Data science encompasses many disciplines and no data scientist is adept at all of them. Dan Wagner, former chief analytics officer for the Obama 2012 Campaign, calls the idea that data scientists can do everything from coding to statistics to storytelling a “great myth.” Even more, it is a recipe for mediocrity. Broadly speaking, organizations building their data science capabilities will need expertise in at least three distinct fields:

- Analytics technology, which includes databases, software engineering, and IT integration. In essence, this is the infrastructure of a data analytics capability, and experts in this area architect and operate that infrastructure.
- Predictive and prescriptive analytics, which encompasses machine learning, statistical modeling, and algorithms. Here, experts are required to build statistical models that can explain existing data trends and predict new ones.
- Experimentation, which involves experimental design and hypothesis testing. Experts with a strong empirical background are needed to correctly execute studies designed to answer specific questions.

Since the training in these three domains come from different academic disciplines, a single person rarely has expertise across the board.

### 4. THE ANALYTICS TEAM SHOULD HELP GET THE JOB DONE.

The chief analytics officer for a leading Internet services provider told us, “In order to be successful, you need to show up with data and troops to support the implementation. I have been in many organizations that do really

interesting data science things, but they didn’t get traction because they couldn’t execute. Today, I have a small group of incredibly talented individuals that I call the *get-stuff-done team* to augment the efforts with incremental resources to drive execution.”

Consider two scenarios. In the first, an analytics translator tells a group of managers that predictive analytics could dramatically increase customer retention. The group grows excited at the prospect. But their enthusiasm is immediately dampened when the translator tells them that all they have to do is review the transactional data of the last 100 customers they lost, contact them, and quiz them carefully about their defection.

In the second scenario, the translator not only offers the advice but is eventually joined by a team that helps collect the required data or helps implement processes that will capture them. Instead of making more work for the unit, this *get-stuff-done team* helps the people there be more successful. It also has the benefit of changing the way analytics is viewed in the company: as an invaluable tool instead of a headache. This more favorable view of analytics will ease its eventual integration into new business units.

### 5. ALL LEADERS NEED A WORKING KNOWLEDGE OF DATA SCIENCE.

As it stands, many managers do not know enough about data science to be able to effectively make use of the data scientists in their organization. We heard from the global head of analytics for a Fortune 50 industrial company, “Once we established analytical capabilities, we realized that we, the executive team, needed to become savvier in better understanding analytics in order to change the conversations in the room and to ask different questions. Now we have ongoing efforts in place at all levels of the organization to make all decision makers more literate in analytics.” As the head of analytics for an online travel company pointed out to us, “There is no lack of data scientists, rather a lack of data-ready managers. It is a two-way street. On the one

hand, you need to better educate the data scientist about the business and, on the other, you need to better educate your business leaders about data.”

---

## Perhaps most importantly, managers need to know whether data are providing actionable insight, or simply providing the illusion of actionable insight.

---

Managers need not become experts in analytics technology, predictive analytics, or experimentation themselves. But they do need to be able to ask relevant questions and have a sense about whether a particular analysis is sound. Should two data science teams present contradictory conclusions, for example, managers have to know enough to act appropriately.

Perhaps most importantly, managers need to know whether data are providing actionable insight, or simply providing the illusion of actionable insight. Consider a hospital with two kinds of ultrasound machines, one manufactured in 2009 and the other in 2013. Both are equipped with real-time sensors, but the newer, easier-to-use model purports to reduce the time required to perform an exam. The analytics dashboard, however, tells a different story: Exams with the newer machine actually take, on average, one minute longer than with the older machine. This information, gathered almost magically without the expense of an elaborate and costly study, leads to a decision not to replace the old machines.

However, further investigation would have revealed that while 85 percent of newer

technicians favored the newer machines, 90 percent of the experienced technicians stuck with the older ones. That is, the difference in how long it took, on average, to use the

two machines was confounded with differences in the expertise of the people using them. A subsequent analysis would have determined that both groups were in fact faster when using the new machine. Data are only as helpful as they are interpretable. As one analytical leader describes it, “A

big dashboard can be like comfort food — it makes you feel good but it’s not necessarily good for you.”

### 6. ANALYTICS SHOULD HAVE A SEAT AT THE TOP TABLE.

“The title of chief analytics officer is new and some people wonder what that means,” says the head of the function at a leading insurance company. “The title allows me to sit in any meeting, listen carefully, and identify opportunities and issues that we could address with data analytics. I report to the CEO. My mandate is to make everybody on the executive team successful.”

Just as the rise of information technology gave birth to the role of chief information officer, the emergence of big data is giving rise to the chief data officer, sometimes known as the chief science officer or chief analytics officer. Creating a C-level role to manage data science makes it more likely that analytics will be integrated into the entire organization. It also sends a message to other promising leaders in the organization that data science offers a way to the top of the organization.

## What Top Analytics Leaders Look Like

The chief data/analytics officer is in charge of developing and deploying data strategy throughout the organization. The role demands excellence in three strikingly different areas:

- **Strategic orientation:** A chief data/analytics officer must be able to find new opportunities to add value, not simply oversee analytics operations. The role requires an understanding of how investments in big data initiatives should be targeted and how fast the organization should move to implement them.
- **Change leadership:** Especially in the early stages of adopting data science capabilities, the chief data/analytics officer must be able to understand and overcome the barriers to putting analytics to work. This will involve developing processes to pry data loose from functional silos, drive data-driven projects across those functions and link initiatives to operations.
- **Collaboration and influencing:** The insights that the data generate may be surprising. They may meet stiff resistance in organizations that rely on past experience and institutional wisdom. In the face of such resistance, an analytics leader must cultivate a compelling vision, earn buy-in from key opinion formers in the organization, and partner with managers to weave analytics into the fabric of the organization.

Not surprisingly, exceptional analytics leaders have strong analytical and technical backgrounds, including advanced mathematics and science degrees. But though necessary, technical chops are insufficient for leadership. The chief data/analytics officer must know how data can be used to transform a firm's strategy or operations. Perhaps this person has acted as a trusted advisor to CEOs,

the boardroom and other top leaders of a diverse set of companies.

## A Different Kind of Disruption

Social media, the Internet, mobile information technology — all of these once-disruptors are today accepted as tools to be leveraged for competitive advantage. But each of these developments initially met with varying degrees of resistance and skepticism. Big data, too, will encounter resistance — but of a particularly stubborn kind. Previous disruptions challenged the way things were done; big data challenges what we think we know. Consider how “evidence-based” decision-making has impacted another field: medicine. For centuries, physicians have relied on their experience and training. But the evidence produced by scientific research in sophisticated care organizations and academia, which are increasingly available in healthcare settings, is often at odds with what experience tells physicians they think they know.

Similarly, data science will upend ideas that have long been taken as a given. Few people like to be challenged in that way. To overcome that deep-seated, all-too-human resistance, organizations need to strive to create an environment where the right to question everything with evidence is taken for granted — where, as with Billy Beane's Oakland A's, the organization itself is shaped around understanding and delivering on the potential of data science.

For leaders, then, big data heralds the emergence of the scientific method as an essential element of leadership. Business is on the cusp of evidence-based managerial decision-making, and it is coming at a pace that is creating a qualitative change and a fundamental challenge.



Kellogg School of Management  
Northwestern University  
2001 Sheridan Road  
Evanston, IL 60208

KELLOGG INITIATIVES Markets and Customers



NORTHWESTERN  
UNIVERSITY