CHAPTER 1

The Challenge of Business Analytics

"In God we trust, all others bring data."

—Edward Deming

Those of you who have teenagers in high school living under your roof understand what a transitional life stage this is for your kids. It is a time of many ups and downs, with great memories being created and, in some cases, momentous life struggles beginning. If you don't have teenagers in your home, imagine for a moment that you have a 17-year-old daughter in high school. She's a wonderful kid, very personable and outgoing, and excels at most things she attempts. You're very proud of her—she is on the honor roll, has a lot of nice friends, has the responsibility of an after-school job, has visions of college, and even has a long-term boyfriend of whom you approve. Being a good parent, you also occasionally monitor her computer use and e-mail activity. You notice that she is getting a lot of e-mails from a retailer to encourage her to buy baby and pregnancy-related items and are concerned that the retailer is glamorizing the notion of teen pregnancy and encouraging her to get pregnant. Furious, you storm into the retailer in person, read the manager the riot act, and demand that these e-mails stop. The retailer humbly apologizes and vows to stop the e-mails. Satisfied, you

head home and relate entire experience to your teenage daughter. To your surprise, she reveals to you that she is indeed pregnant and is expecting a baby in five months.

According to a *New York Times* story, this is exactly what happened to a customer of the large retailer Target. Practically speaking, Target's business analytics activities informed the father that his daughter was pregnant. Specifically, Target statistician Andrew Pole used data-mining techniques to create a "pregnancy predictor" based on online shopping activity. If a customer scored high enough on the pregnancy predictor, Target would send e-mails with offers for pregnancy-related products:

> As Pole's computers crawled through the data, he was able to identify about 25 products that, when analyzed together, allowed him to assign each shopper a "pregnancy prediction" score. More important, he could also estimate her due date to within a small window, so Target could send coupons timed to very specific stages of her pregnancy.
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> [Pole] ran test after test, analyzing the data, and before long some useful patterns emerged. Lotions, for example. Lots of people buy lotion, but one of Pole's colleagues noticed that women on the baby registry were buying larger quantities of unscented lotion around the beginning of their second trimester. Another analyst noted that sometime in the first 20 weeks, pregnant women loaded up on supplements like calcium, magnesium and zinc. Many shoppers purchase soap and cotton balls, but when someone suddenly starts buying lots of scent-free soap and extra-big bags of cotton balls, in addition to hand sanitizers and washcloths, it signals they could be getting close to their delivery date.
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> Take a fictional Target shopper named Jenny Ward, who is 23, lives in Atlanta and in March bought cocoa-butter lotion, a purse large enough to double as a diaper bag, zinc and magnesium supplements and a bright blue rug. There's, say, an 87 percent chance that she's pregnant and that her delivery date is sometime in late August.[1]

Data privacy debate aside, the Target example is a brief illustration of the insights that can be gained through leveraging big data in an

effective business analytics practice. If you are reading this book, we assume you see the importance, as we do, of using business analytics to positively affect your organization. You may be a business leader who wants to learn more about how companies use data effectively. You may be an analytics manager who wants to understand pitfalls to avoid that can lead to failure. You may be motivated to learn some of the latest techniques and best practices of how to use different types of information across the enterprise. You may be an analytical professional and want to learn how to take your organization's analytics to the next level. You may be an HR leader who wants to learn about data across the enterprise so you can decide how best to use it to make strategic human capital decisions. Whatever your motivation for reading this book, we assume your organization has business challenges that you hope data and the practice of business analytics will help you overcome.

Effective business analytics is a focus for business leaders across the globe in ever-increasing numbers. A 2011 report by the McKinsey Global Institute projects that the United States needs 1.5 million more data-literate managers to meet the demands of the data-driven enterprise.[2] In addition, during IBM's 2012 IBM PartnerWorld Conference, its CEO predicted that analytics will be the thread that weaves together front- and back-office systems in order to give companies that harness huge volumes of unstructured data a competitive business advantage.[3] Also, a recent International Data Corporation (IDC) report predicts that the business analytics market will grow 8.2% in 2012 to $33.9 billion.[4] It is gradually becoming clear that in today's cut-throat business climate, failing to leverage business analytics effectively in your organization can be the difference between thriving or slow death.

Because business analytics is rapidly evolving and often indicates different things to different people, we think it is important to outline what we mean by "business analytics" for the purpose of this book. We define business analytics as the integration of disparate data sources from inside and outside the enterprise that are required to answer and act on forward-looking business questions tied to key business objectives. We realize this is a fairly broad definition; however, our experience in practicing business analytics, as well as the hundreds of companies

that have provided input, indicates to us that business analytics is moving away from an isolated reporting and dashboard mentality and toward an integration of various types of information across the organization in tighter alignment with the business goals of C-level executives.

Even though business analytics is a relatively new field, we see it as having the potential for great organizational impact and importance, much beyond that of the more traditional and isolated reporting function, research department, or "business intelligence"–related activities. Actually, the practice of business analytics is beginning to have a meaningful impact in many companies, some of which we profile in this book.

There are several key components worth noting in our definition that may differ from more traditional definitions of business intelligence, research, Web analytics, information retrieval, data mining, or other related disciplines. First, in our view, effective business analytics must be grounded in key business questions. The amount of data available to businesses is overwhelming and is growing at an exponential rate, and it's easy to enter analysis paralysis or drift into intellectual curiosities. Therefore, organizations must articulate and prioritize the key questions they want business analytics to answer.

Second, we believe that business analytics has the most impact on the organization when it is forward looking—not backward looking. In other words, business analytics is most useful when it is predictive and provides a lens into the future regarding likely business outcomes.

Third, to us, the new age of business analytics requires the integration and synthesis of various information disciplines across the organization, such as marketing research, Web analytics, business reporting, competitive intelligence, customer data, and outside data sources, among others, in order to be effective. If you recall, from our definition, all effective business analytics should be grounded in key business questions and objectives. Those business questions and objectives do not care about your organization's structure—that some of the data are in finance, some are in marketing, and some are in product. Those business questions simply demand an answer, and whichever organization can answer them consistently, with speed and accuracy, will win. Will that be you or your competition?

THE CHALLENGE FROM OUTSIDE

We see several business challenges that led up to the newfound focus on business analytics, as well as several challenges that business analytics must rise to meet.

We all know that the economic environment has been more intense and challenging than ever before. At the time of this book's writing, the global economy is still on unsure footing, consumers are still being conservative about their spending, the real estate market has not fully recovered, and businesses are struggling to understand how to grow effectively, yet profitably. In the first quarter of 2012, the chairman of the Federal Reserve, Ben Bernanke, was still predicting only modest growth during 2012, expecting economic and job growth to remain somewhat muted through the remainder of 2012.[5] Those companies that identify with the Fed's cautious outlook see the economic glass as half-empty and are trying to hold market share, stem losses, and keep their current customers happy.

Yet business and consumer confidence is showed signs of improvement during 2012, and the long-term payroll data trend from the Bureau of Labor Statistics indicates that companies have started to create new jobs. Therefore, optimistically minded companies are eagerly trying to be smart about staying ahead of business trends, as well as about how to capture some of the impending economic growth. Regardless of whether your future business outlook is optimistic or pessimistic, effective business analytics is becoming a required component of business success.

Another business challenge driving the increased importance of business analytics is that business competition has become more intense. It's easier to start a business with little capital and, in some cases, gradually disrupt an entire industry or invent a new one. Take the case of Amazon, the well-known online retailer based in Washington State. Started in 1994, it spurred the rise in the online purchase of books and music and was, in part, responsible for the relatively rapid decline of bricks-and-mortar stores in the book and music industries. These types of examples should motivate most organizations to acquire as much data about competitors and their industries as possible.

Part of addressing competitive threats is to monitor and stay one step ahead of your competition—tracking, analyzing, and integrating everything you know about your competitors into the analytics of your own company. For example, do you know your market share trend over time, the strategies and tactics your competitors use to sell to customers, how your products are perceived compared to theirs, which of your customer segments are more likely to defect to the competition, or why some customers use only your competition and not you? If your organization has timely and thorough answers to these types of questions, then bravo. Many companies rely on informal feedback about the competition and do not have solid analytical systems in place to address these issues.

Another business challenge that's leading to an increase in companies relying on business analytics to drive their strategy is that customers are becoming more fickle, and loyalty to products and services is rarer than ever before. Mark Ratekin from Walker Information Group, a respected leader in the measurement of customer loyalty, indicated, "We, too, have seen evidence of a shift in customer sentiment toward more of the High Risk category. Interestingly, there is a similar trend starting to occur among employees—more and more employees are becoming less engaged, and are planning to look for new work when the recession ends."[6] The decline in employee loyalty is also seen to be affecting the quality of the service provided to customers. Given all of this, it's extremely crucial for businesses to understand customer issues, such as what drives purchase intent, purchase preference, and purchase behavior. Doing this without systematic analytics and voice-of-the-customer input is almost impossible—unless you have only one or two customers. In that case, you may have business challenges to address beyond just analytics.

Given intense business competition, existing companies must continually monitor their customers' behaviors and feedback, remaining on guard for new entrants into the marketplace. Companies are under great pressure to continually and rapidly reinvent themselves and how they offer value to customers, and failing to accurately listen to customers and track their behavior often results in certain and swift demise. Take the case of Polaroid, the well-known brand of instant photographic equipment that failed to capitalize on the growing trend of digital

photography. Polaroid was founded in 1937 by Edwin Land and was one of America's early high-tech success stories. The catapult of its success was the invention of camera film in 1948 that developed a photograph in minutes—much faster than other methods at the time. This competitive strategy was successful for Polaroid through 2001, when Polaroid filed for bankruptcy due to the rapid decline in the sale of photographic film. The irony is that Polaroid had been investing heavily in digital photography technology and was actually a top seller of digital cameras into the late 1990s. Yet although Polaroid invested a lot in technology R&D, the company failed to take a business analytics approach and understand that customers were relying more on storing digital photos on their computers, rather than printing a paper copy of each picture. If Polaroid had integrated accurate voice-of-the-customer input and customer analytics into its business analytics strategy at the senior executive level, it may have been able to adapt its strategy away from photographic print film and toward a successful digital photography play.

With customer loyalty elusive, the number of sales and marketing messages seen by your customers is also ever-increasing and is another business challenge driving the importance of business analytics. In the United States, marketers send more than 90 billion pieces of direct mail each year, trying to influence the behavior of customers.[7] Also, the Radicati Group estimates that nearly 90 trillion e-mails are sent each year, and certainly a large percentage of these are from businesses trying to get your customers to try their products.[8] Furthermore, eMarketer expects that U.S. online advertising spending will grow 23.3% to $39.5 billion during 2012, pushing it ahead of advertising spending in print newspapers and magazines.[9] In terms of traditional media, according to Media Dynamics, a media research group, the average American is exposed to a minimum combined total of 560 advertisements each day from radio, print, and television.[10] At the same time that this sales and marketing onslaught pervades our daily lives, the customer's attention span is shrinking, with customers seeking to avoid marketing messages through the use of digital video recorders that can skip ads, e-mail spam blockers, do not call lists, do not mail lists, and other techniques to avoid being exposed to your message. Given these challenges, the world of multichannel

customer acquisition requires the effective use of business analytics to untangle the complex patterns of brand and product perception that arise from being exposed to so many marketing messages from so many channels.

At this same time, the promise of new media to help businesses grow and ensure success has reached somewhat hysterical proportions and is another business challenge leading to the importance of business analytics. Mobile usage continues to increase dramatically on a global basis, as does the use of social media and other online content, such as micro blogs. You can even call mobile and social media mainstream media at this point. At the end of 2011, there were roughly 6 billion mobile phone subscriptions worldwide, with some users having service on more than one device.[11] According to the Direct Marketing Association, 36% of consumers now follow brands on social media platforms.[12] Also, the number of social media users age 65 and older grew 100% during 2010, so now one in four people in that age group is part of a social networking site.[13] As an example, one of the authors of this book, Jesse Harriott, has a 94-year-old grandmother who recently purchased a cell phone and started searching Facebook to find people she knows.

This new media is taking a lot of the friction out of learning about a product and about choosing a company brand. Yet with the increase of new media and the multitude of ways to interact online comes a flood of new data into the organization. Every interaction someone has with your brand or product in an electronic medium, such as an Internet search engine, a website, a social media platform, an electronic coupon provider, a blog post, or a mobile device, generates a data trail. Other interaction points are also growing and generating massive amounts of data in their wake. For example, there are unknown quantities of digital tracking sensors in shipping crates, electric meters, automobiles, industrial equipment, and various other devices. In addition, GPS, wifi, and Bluetooth position tracking by mobile devices is widespread and generates massive streams of location data that companies are beginning to harness.

Given that economic pressures remain, that business competition is more intense than ever, that customer loyalty is all but gone, and that new media usage is on the rise, it is no surprise that the use of

business analytics is gaining new prominence. These are the challenges for the business analytics discipline, the challenge to help organizations thrive and prosper. It's clear that using effective business analytics is seen as a way to address these key outside business challenges and that business analytics holds great promise to help you understand what your customers want from you, figure out how to acquire new ones, and learn what will lead to a repeat purchase. Yet most organizations we speak with are struggling to make sense of what these data can tell them or how they can use it. Therefore, we have designed this book to help businesses think about, organize, and make the most of the data assets available to them. Throughout this book, we provide examples of companies that are doing it well, along with some that are not.

THE CHALLENGE FROM WITHIN

Whatever your specific outside challenges driving you toward business analytics, there are also challenges for analytics inside the organization. In other words, how do you unleash the power of analytics to address the business challenges that are most critical to your organization, while overcoming typical pitfalls inside your company? If you could only find that brilliant data scientist and woo him or her into your organization, then everything would be all right, and your company could do brilliant things with its data. That one genius could help you segment your market effectively, increase your number of customers, reduce the customer attrition rate, predict what will make new customers buy, predict online customer behavior, and increase your company market cap by 30%, right?

Wrong. Certainly, smart and knowledgeable staff is important in helping you make good use of your data—but that is nowhere near enough. Several other challenges from within your organization need to be addressed before you can reach data nirvana using brilliant data scientists. This book is designed to help you address those internal challenges, but first, let's outline a few of them.

To illustrate some of the internal challenges to business analytics success, let's take the case of executives we spoke with at a company as part of the background research for this book. Out of respect for the company, we won't name it; however, let's just say it is a fairly

well-known media company. Executives at this media company expressed some analytical angst to us during our interview. They said they realized a few years ago that their unstructured data were an untapped resource to help their business strategy, as well as help their customers. So they went searching for someone with the requisite degrees and experience who could lead the work with their data to help them unleash the data's potential. They searched for seven months (these people are in demand) and finally found someone with a statistics degree, computer science experience, great references, and a solid track record of helping well-known brands analyze their data. They hired him and put the existing seven analysts already at the company under his management. They were very optimistic with their new key hire and set him immediately to work on analyzing customer segments with a large average order size and a long tenure, versus those without, in order to understand how to better target prospective sales and marketing that would yield profitable relationships with a solid customer lifetime value. They said everything started off well at first—the team was optimistic and energized with its new team member. However, problems gradually started to develop. First, the analytics team went away for weeks at a time, with little data analysis completed, and then when something was delivered, it was usually lots of raw data and a graph or two, all of which were difficult for the businesspeople to understand. Second, the new team occasionally provided stats that were in conflict with other analytics teams in the company or what had been common company wisdom in the past—setting off ill will between departments and spates of dueling data that often took weeks to untangle. Next, it seems as if the analysts would occasionally come out with numbers that were different from the analysis they had provided just a few months earlier, which frustrated the business to no end.

The executives at the company attributed these challenges to the difficulty of doing analytics and tended to blame the analytics team for the problems. As a result of our interview, however, they gained an expanded view that it was very likely that the overall organizational dynamics within the company may have been the cause of their analytical team's difficulties.

First, we asked what company leadership sponsored the hiring and formation of this analytics team. It was explained to us that a

long-tenured VP of marketing commissioned this initiative, and everyone had great faith that she could make the best use of these analytical resources. When we followed up regarding whether the most senior corporate or functional leaders were also in favor of forming this team, we were told that they were not completely sure, because no one beyond the SVP whom the marketing VP reported to was consulted. This illustrates our first internal challenge that business analytics must overcome—weak executive sponsorship. Unless a senior leader within the organization is a driving force behind business analytics and is aware, supports, and believes in the mission of the business analytics discipline over the long term, then it will likely have difficulties thriving and may fail eventually, due to shifting corporate priorities, company politics, and lack of corporate accountability.

Second, we asked what process the company had undergone to make sure its corporate business objectives were in line with the objectives of this new analytics team. We uncovered that the executives didn't really communicate corporate objectives to the new analytics leader or his team, because they thought the team simply needed to analyze data and not worry too much about corporate priorities. This illustrates the second internal challenge that a business analytics function must overcome: failure to communicate and align business analytics priorities against corporate priorities.

Third, we noted that surely technology systems and resources were required to help the analytics function do its work, so we asked how the analytics team worked with the technology team that supported these analytics initiatives. For example, did the technology resources report in to the new analytics team? Was there a direct line of accountability in some other way? We were told that the company did not set up any formal arrangement but relied on the new analytics manager to build a bridge and work across the departments. This illustrates our third internal challenge that the practice of business analytics must overcome: weak alignment and lack of accountability from the technology support function.

Next, we asked whether there was any data quality or governance function within the company to ensure that definitions were standardized and data were accurate. We were told no, but that it was the analytics team's responsibility to make sure that whatever data and

analysis were distributed were accurate and reliable. This leads us to the fourth internal challenge: lack of formal data governance. It takes dedicated and diligent effort from business and technology to ensure that data being published from various systems is accurate and reliable, and this cannot be merely an afterthought by a few analysts simply because they happen to be last in the chain of data distribution.

Then we asked how the new analytics team's activities were rationalized against the activities of other analytics departments, such as product, service, finance, or strategy teams. We were told that they did not really communicate with one another formally and didn't initially think it was necessary because those teams were working on different analytical tasks. This illustrates the fifth internal challenge: weak alignment of existing analytical resources within an organization. We explained that in order to reduce the likelihood of a duplication of efforts and of dueling data, as well as to ensure that the company is leveraging the collective knowledge of the analytical resource most effectively, there must be some type of formal alignment across analytical teams. That can take the form of a reporting relationship to a single manager or simply a formal communication and management cadence across different analytical teams throughout the enterprise. The right solution depends on corporate culture and maturity and is definitely open for debate, as we have seen both work well under different circumstances. There are several ways to overcome this challenge, and we will outline each later in the book.

Many internal challenges will crop up on the way. These are just some of the internal challenges a business analytics function must rise to meet in order to become business relevant, fast, insightful, and predictive; have a bias toward action; and become part of the corporate culture. We don't claim this book will solve all of these issues for everyone. Yet we know that the best practices, lessons learned, and assessment tools within will go a long way toward helping you make sure your business analytics is world-class.

This book is organized in such a way as to help you build on your knowledge as you read from chapter to chapter. We have also attempted to define and organize the chapters so that they can stand on their own. For example, if you are primarily interested in learning

about how companies effectively use Web analytics across the enterprise, you can jump to Chapter 9, "Leveraging Digital Analytics Effectively." However, if you want to learn about how to successfully evolve an analytics function, then we suggest you read the chapters in order and ask yourself hard questions about whether your company is doing everything it can to *win with advanced business analytics*.

KEY TAKEAWAYS

- The field of business analytics is evolving. It's becoming less about data silos and more about the integration of different data assets across the company.
- There is a skills shortage for knowledgeable data professionals. It's expected to get worse, not better.
- Business analytics is being driven by several external factors, such as increased competition, decreased customer loyalty, economic woes, and the proliferation of new media.
- Business analytics requires many internal factors to succeed, including strong executive leadership support for analytics, effective technology infrastructure and tools, alignment with corporate priorities, and effective communication across departments.

NOTES

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