

The Future of Business Intelligence

The future of business intelligence centers on making BI relevant for everyone, not only for information workers and internal employees, but also beyond corporate boundaries, to extend the reach of BI to customers and suppliers. As the Successful BI case studies have demonstrated, when best practices are applied, BI usage can expand beyond the paltry 24 percent of employees today to a much more prevalent business tool. It will take cultural shifts, new ways of thinking, and continued technical innovation. Business intelligence has the power to change people's way of working, to enable businesses to compete more effectively and efficiently, to help nonprofits stretch their dollars further, and to impact everyday life. All of this is possible based on insights available at the click of a mouse, push of a button, or touch of a screen.

As discussed throughout this book, much of the key to successful business intelligence has to do with the people, processes, and culture. Don't rely on technical innovation alone to solve the biggest barriers to BI success, but by all means, do get excited about the innovations that will make BI easier and more prevalent. BI as a technology has changed dramatically since its inception in the early 1990s. This chapter focuses on emerging innovations with examples of how customers are taking advantage of them. I also provide a maturity model so you can benchmark your current state and track your evolution by the factors that most enable big impact. In the final section, I leave you with some words of wisdom to inspire you to think about how your company can best unlock the full value of BI and big data.

Improvement and Innovation Priorities

As part of the Successful BI survey, respondents were asked to choose from a list of possible improvements and emerging technologies that they believe will help their companies achieve greater success. Figure 14-1 shows which items are considered most important in helping companies achieve greater impact. Dashboards were rated number one, an interesting priority given that 79 percent of companies already said they had successfully deployed them (see Chapter 12, Figure 12-6). However, many initial dashboard deployments were limited in scope and often based on custom-developed solutions. With new and improved dashboards now available from more BI platform vendors, the use of dashboards can be expanded well beyond just a handful of users and beyond just managers and executives. Self-service BI and mobile BI were the second most important priorities. As discussed in Chapter 3, self-service BI encompasses a spectrum of capabilities. Visual data discovery is just one module (but an important one) that delivers self-service BI. It was surprising to me that only 36 percent of companies cited

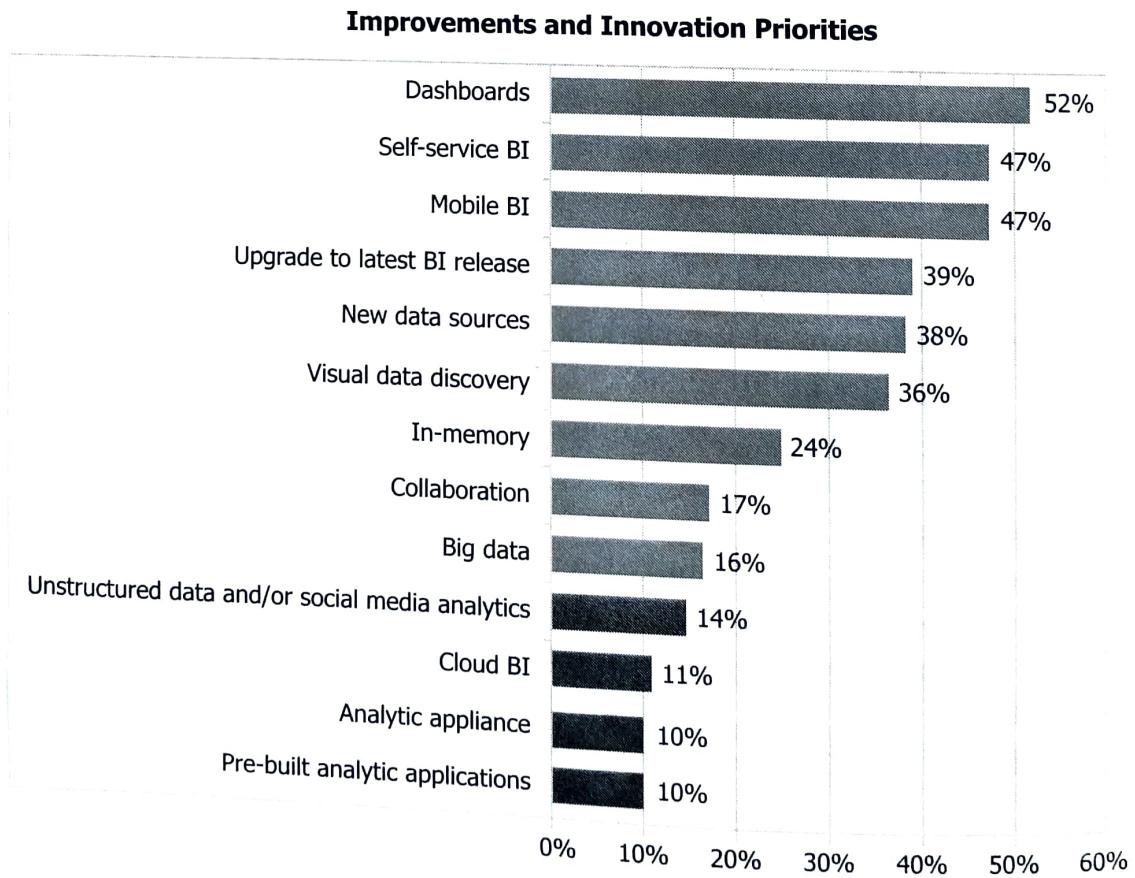


Figure 14-1 Dashboards, self-service BI, and mobile BI are top innovation priorities.

this as an improvement priority, suggesting that there is still a long way to go in educating people on the value and different uses cases for this module. Upgrading to the latest BI release and expanding to new data sources were rated third and fourth as priorities. Given that many BI teams do not have adequate resources, simply maintaining an existing environment and user base often trumps leveraging new innovations. As one BI director told me, “We are a victim of our own success.”

If your BI deployment is successful, even on a small scale, demand can quickly outpace the BI team’s ability to deliver.

These survey results show an interesting contrast: BI industry conferences and media headlines would suggest that big data and cloud should appear higher on the list of priorities. To a certain extent, the difference shows the hype around these technologies. More importantly, it shows that awareness and education precede widespread usage (similar to your own internal BI marketing efforts discussed in Chapter 13, Figure 13-3). Companies are still learning about these technologies, doing proofs of concepts, and assessing how best to use them. Also, when I think of the challenges of serving a large BI user base while simultaneously innovating, I recall a quote from a BI vendor working to deliver a major platform upgrade: “It’s like retooling a jetliner mid-flight.”

There is not an easy fix for this innovator’s dilemma. However, I do think part of the solution has to be a continuing assessment of your BI organizational model and the business–IT partnership. As business users become more sophisticated in their technical skills, let those power users assume some of the responsibilities that once belonged only in the domain of the core BI team. This allows the core BI team to work on harder analytic problems and new innovations. Also, some of the technical innovations allow IT to do more with less:

- In-memory technology can free DBAs and other analysts from manual performance tuning.
- Cloud computing frees technologists from maintaining an on-premise infrastructure.
- Visual data discovery tools allow users to explore subsets of data without IT having to first extensively model a data source.

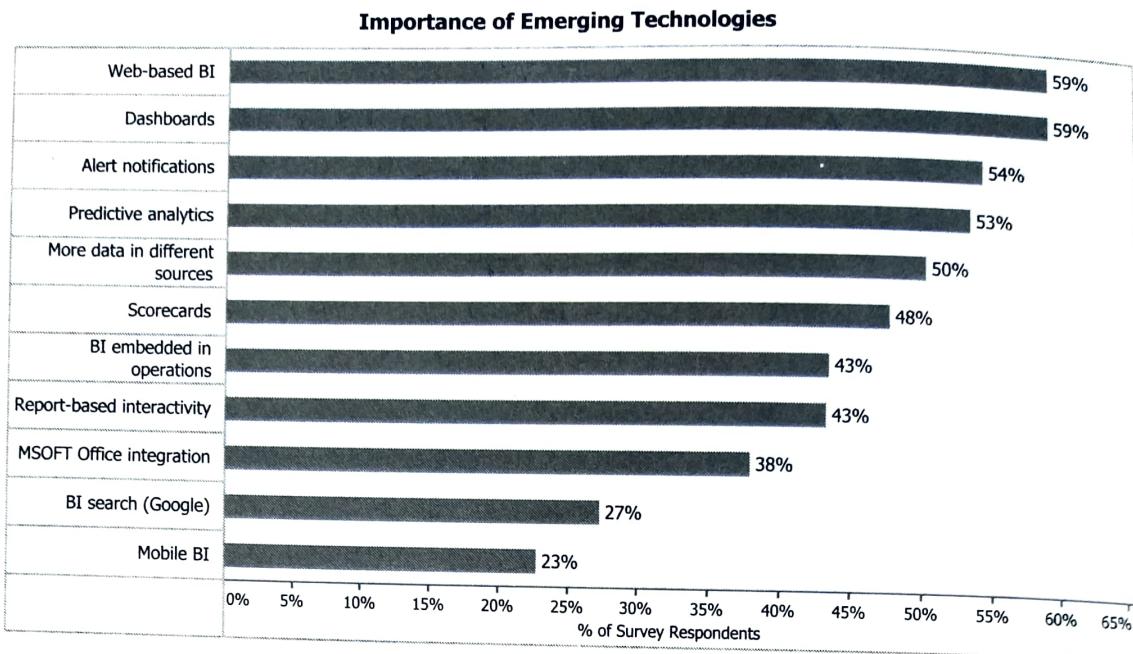


Figure 14-2 In 2007, web-based BI was the top innovation priority.

A Look Back: The Pace of Change

As I was re-reading the text from this chapter from the 2007 book, I was staggered to see that deploying web-based BI tools was the top innovation priority back then. Really? I had forgotten that only six years ago, most BI tools were predominantly desktop based. Their web-based counterparts were still rudimentary. This web-versus-desktop debate is recurring with visual data discovery tools. And mobile BI was rated last for priorities. So for the sake of posterity, and to show just how quickly technology changes, I thought you might find it informative to compare priorities from 2007, as shown in Figure 14-2.

A Framework for Prioritizing Innovations

In teaching my “Cool BI” classes at The Data Warehousing Institute (TDWI) conferences, I use the concept of MVP to help companies assess their innovation priority:

- **M for Maturity** Consider the maturity of the technology or the maturity of your solution provider’s capabilities for the technology. Less mature solutions may have more risk and disruption. However, there also can be benefits in terms of first-mover advantage to pursue less mature innovations.

- **V for Value** Some innovations provide value in terms of big insights or lower cost to serve.
- **P for Positioning or Pervasive BI** Consider if the innovation solves a problem for a small segment of users, such as power users, or helps BI become more pervasive to the outer spectrum of more casual BI users

Figure 14-3 provides a framework for evaluating changes in BI technology to determine which new and emerging capabilities will prove most valuable to your company, how mature they are, and when to monitor them or when to embrace and actively deploy them (adapted from TDWI's Technology Evaluation Framework). The X axis provides an indication of how mature the technology is, and the Y axis gives an indication of which technology will make BI pervasive. Recall from Chapter 4 that the average usage of BI within a company is currently at 24 percent, and even if the budget were available and the deployment were wildly successful, survey respondents felt the use rate would extend only to 54 percent of employees. The Y axis, then, indicates the degree to which an enabling technology will take BI's reach closer to

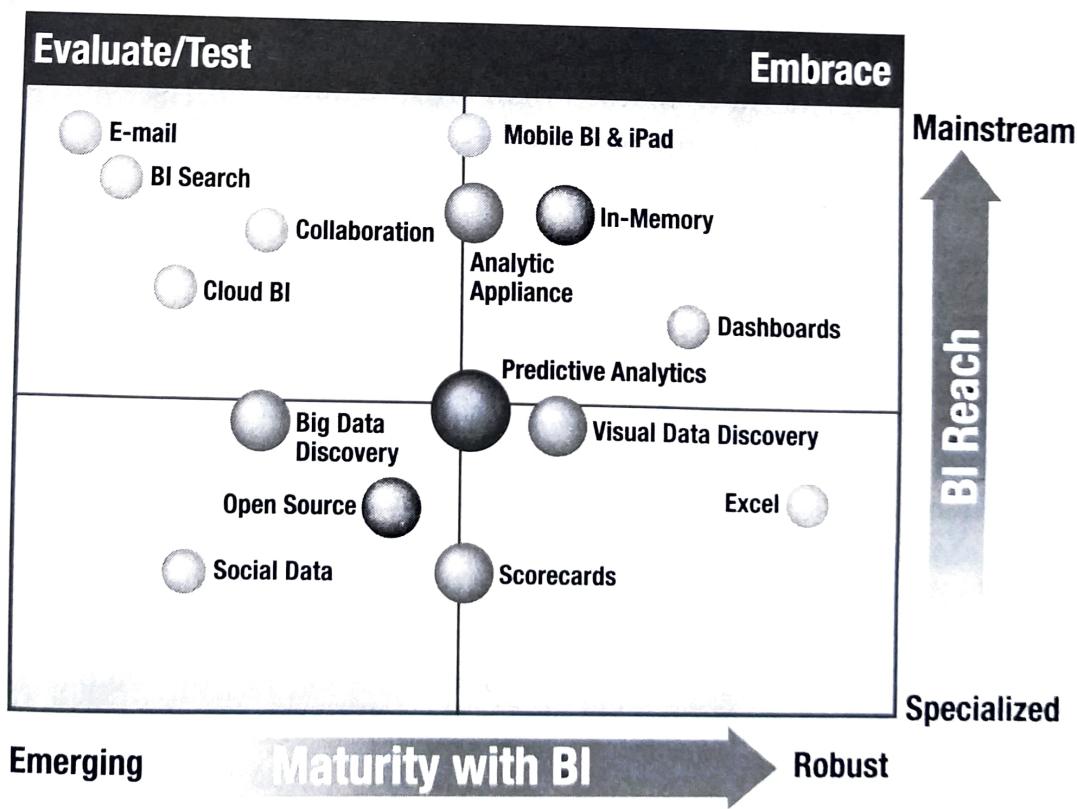


Figure 14-3 BI technology evaluation

100 percent of employees. Business impact and BI prevalence are not linearly correlated, however. One enabling technology, such as predictive analytics, may yield a big value for a single decision—say, a \$4 million savings by better marketing campaign management. Another enabling technology, such as BI embedded in operational processes, may affect thousands of users, each of whom makes dozens of decisions on a daily basis; the monetary value of these individual decisions may be small when measured in isolation, but enormous when taken in aggregate. The size and shading of the bubbles in Figure 14-3 give an indication of which items have a bigger value from a single application or insight. The bigger the bubble and darker the shading, the bigger the impact on a single decision or person.

For each innovation, consider both the technical maturity and the business impact when deciding how to proceed:

- **Embrace** Items in the upper-right quadrant show innovations that are mature and that should be embraced, as they will help speed user adoption across multiple user segments.
- **Adopt Where Appropriate** Items in the lower-right quadrant show innovations that are mature but that may serve only specific segments of users. Excel integration with BI is an example of this; the technology is more mature than BI integrated with e-mail, for example, but benefits only power users who use spreadsheets as part of their daily work.
- **Test** Items in the upper-left quadrant are relatively new but will have a profound impact on user adoption. BI Search (a Google-like interface, discussed in the next section) is a good example of this. The technology is not well understood or widely supported across the industry. A number of usability and performance issues still need to be worked out, but the potential impact on user adoption is enormous. You may build some prototypes and conduct proofs of concepts with business users to validate the value of these innovations.
- **Evaluate** Items in the lower-left quadrant are so new that they may be riskier investments. Items here are less proven and have less market adoption. You may have to invest in solutions from start-up companies. For some of these technologies, you may simply monitor industry trends and case studies of early adopters. For others, and if you have an innovation lab as discussed in Chapter 13, you may do some prototyping and adopt for particular use cases.

Figure 14-3 portrays the broad industry maturity of these capabilities and the degree to which most vendors offer the capabilities. For clarity, I have selected only certain innovations; it is not meant to be an exhaustive list of all things going on in the industry. I consider the items in the context of integration with business intelligence. So while advanced and predictive analytics is certainly a mature concept and technology, the integration of it with business intelligence is still a work in progress. Similarly, the use of social networking is mature, but analyzing that data using traditional BI tools for business decisions is immature. Instead, most of the social analytics rely on stand-alone Hadoop deployments that are not integrated with a larger information analytic environment.

The subsequent sections describe these capabilities that have not otherwise been addressed in Chapters 2 and 3.

BI Search & Text Analytics

The concept of BI Search offers a number of promising benefits to business intelligence and big data:

- Simple user interface.
- A more complete set of information to support decision-making, with the integration of structured (quantitative) and unstructured content (textual). Structured data refers to the numerical values typically captured in the operational systems and subsequently stored in a data warehouse. Unstructured content refers to information stored in textual comment fields, documents, annual reports, websites, social media, and so on. Some people will refer to this as semi-structured information.
- Users can find what they need through search, rather than through navigating a long list of reports.

Text analytics is closely related to search in that unstructured information or text can be transformed into quantitative data. For example, it allows for the searching of information in a comment field to see how many times a customer praised a particular product. Text analytics is the numerical analysis of textual information.

Despite all the improvements in data warehousing and BI front-end tools, users continue to feel overwhelmed with reports, yet undersatisfied with meaningful information. They don't know what's

available or where. Similar reports are created over and over because users don't know which reports already exist or how, for example, the report "Product Sales" differs from "Product Sales YTD." In addition, consider how at Medtronic some of the most valuable information is hidden in textual comment fields that were not readily accessible in the past. Similarly, BI initiatives at Constant Contact may have started in marketing and in statistics around e-mail campaign effectiveness (such as open and click rates), but they are evolving to include looking at the content within those emails to determine which messaging is more effective.

A BI Search interface promises to change the way users access information. Picture a Google interface to BI. Without any training in a BI tool, users can enter a phrase such as "Recent sales for customer A" and then be presented with either a list of predefined reports or, in some cases, a newly generated query. The added benefit is that in addition to displaying reports coming from the BI server, the search engine will list textual information that may be relevant—a customer letter, sales call notes, or headline news. When search capabilities are combined with text analytics, a report may include numerical data based on a scan of comment fields to compare the number of complaints with the number of positive comments. Never before has such unstructured data been so nicely accessible with structured or quantitative data.

If the integration of search and BI is successful, it is yet another innovation that will make BI accessible and usable by every employee in an organization. According to Tony Byrne, founder/president of The Real Story Group, a technology evaluation firm focusing on enterprise search and content management systems, search as a technology has existed for close to 60 years.¹ *Consumer* search (Google and Yahoo!, for example) as a technology emerged with the Internet in the mid-1990s. In many respects, the success of consumer search has helped spur interest around *enterprise* search, in which companies deploy search technology internally to search myriad document repositories. Text analytics has existed for more than 30 years but with usage in limited sectors, particularly, the government. The convergence of search with business intelligence first emerged in 2006. Google is not the only enterprise search solution that BI vendors support, but it is one that has the most consumer recognition and thus has helped business users to understand the possibilities. As open source has gained traction, a number of BI vendors are leveraging the open-source search engine Lucene.

The incorporation of text analytics with traditional business intelligence is still in its infancy. I place BI Search along the left side of the quadrant in Figure 14-3 because it is less mature than other innovations. Again, both technologies, independent of BI, have existed for decades; it is that convergence with BI that is new. While the convergence is still relatively immature, the promise it brings for BI to reach more users and in the value of incorporating textual data is enormous, and that is why I position BI Search near the top of the quadrant.

The number of organizations taking advantage of the BI Search and text analytics integration is a small portion of BI deployments. BlueCross BlueShield (BCBS) of Tennessee (TN) is an early adopter of these capabilities.² BCBS of TN is a not-for-profit provider of health insurance. In 2006, it paid \$17 billion in benefits for its 2 million commercial members.³ Managing claims and negotiating rates with providers is critical in ensuring BCBS can meet its obligations to the members it insures. While the insurer has had a mature business intelligence deployment since the late 1990s,⁴ Frank Brooks, the senior manager of data resource management and chief data architect, recognized that there was value in bringing the text data stored in comment fields from call center notes together with information in the data warehouse.⁵ Given how new the technology is, Brooks asked their BI vendor, Cognos, along with IBM (who produces the search solution OmniFind) and SAS (who offers text analytics solution Text Miner) to work together to develop several prototypes and show the business users the concept of bringing BI, enterprise search, and text analytics together. With this capability, a business user can enter the keyword “diabetes” in the OmniFind search box and be presented with a ranked list of things, such as

- Cognos reports and Online Analytical Processing (OLAP) cubes that show claims paid for diabetic treatments
- Call center notes that involve diabetes
- New research on improving care for diabetes patients

The business was enthusiastic. There has been a high degree of collaboration between BCBS of TN and its information technology partners to understand the new capabilities, develop the right infrastructure, and optimize the indexes to provide the best search performance.

Consistent with the evaluation framework in Figure 14-3, understanding new technologies requires a significant amount of evaluation

and testing. BCBS of TN evaluated the capabilities for more than a year before developing plans for implementing this in production.

Text analytics is part of the SAP Hana platform and was a key reason Medtronic selected this technology despite its newness.⁶ Prior to this, users would download long comment fields and search through text manually. Hana includes a simple Google-like interface so users can enter a keyword such as “Stent” and it will yield results from all comment fields. Hana can use natural language processing to determine if the context of the reference was positive or negative, as well as provide occurrence counts.

Collaboration

The rise of social networking has offered another source of data to be analyzed and explored. It also is having an influence on the way people want to share and interact with data. For most large BI vendors, initial attempts at collaboration have centered on adding comments to particular fields in a tabular display, a database, or a point in a chart. However, more forward-thinking vendors are trying to bring a Facebook-like or Twitter-like feel to the BI platform. There is a concept of “following” people who are the experts in the company. With this model, a central IT organization does not grant access to the data. Instead, the knowledge owner grants access. This degree of flexibility can be unnerving with certain data types and in certain industries. However, assuming privacy and security rules allow the collaboration, imagine how much more quickly decision-makers could find the data and the people with the insights.

Panorama Software in Israel has been doing some interesting work in this space. Panorama Software is a privately held company that sold the OLAP technology to Microsoft in the mid-1990s that later became Microsoft Analysis Services. Their BI platform that includes collaboration is referred to as Necto and is shown in Figure 14-4. Notice across the top the people to follow. Comments around the visualizations appear in the pane on the left. And just as social networking sites such Facebook and LinkedIn will recommend connections, Panorama Necto will look at a user’s usage pattern and recommend other data sets or experts to follow.

A few other vendors have been applying the concepts of social and collaboration in the BI tools and platforms, but adoption has been limited and a preferred approach continues to be debated. Should the collaboration occur in the report or dashboard or should it occur in an overarching product such as a company portal? In some cases, the vendor initiatives seem to be just checkboxes of features (“yes, we do



Figure 14-4 Panorama Software brings concepts of social networking to BI.

collaboration”), rather than getting at the heart of how decisions are made and how information is shared. To be sure, collaboration in BI has the potential to be revolutionary, but only if there is a strong culture for openly sharing data.

E-mail and Microsoft Office Integration

Integration of BI with Microsoft Office Excel is a mature product category, and spreadsheets may be the preferred interface for business analysts. But moving beyond the inner spectrum of potential BI users (refer to Figure 12-4 in Chapter 12), an interface more widely used than spreadsheets is e-mail. If you think about how much time you spend in e-mail versus other office tools, e-mail probably accounts for the largest portion of time. E-mail and text messages are natural interfaces for sending an alert when there is an exception. But imagine if e-mail was the primary interface to all your BI reports and dashboards, not just the ones with alert notifications. SAS is currently one of the few vendors that use the Microsoft Outlook client as a BI interface. Notice in Figure 14-5 how folders of reports from the BI server appear as e-mail folders. Critical key performance indicators (KPIs) can be displayed in a gadget

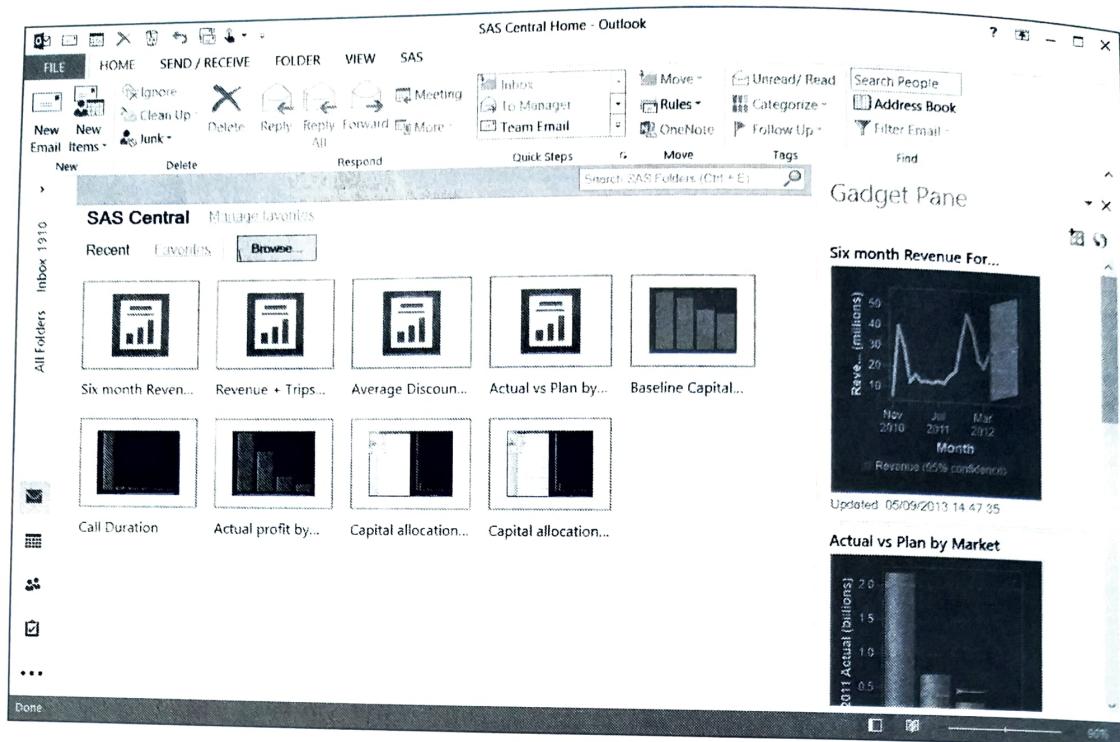


Figure 14-5 SAS BI allows KPIs and reports to be navigated from within e-mail.

pane along the right. In this way, the e-mail interface becomes the main access point for BI content, bringing BI into a user's daily workflow.

In addition to e-mail integration, some vendors are improving the integration with PowerPoint. PowerPoint is typically used for presentations, and data from a BI tool may often be embedded in or replicated within a presentation. As the concept of story telling with data grows, vendors may leverage PowerPoint or other means of presenting data in a guided way.

Will Hadoop Kill the Data Warehouse?

As discussed in Chapter 2, two of the biggest differences between Hadoop and data warehousing are software cost and the degree to which data must first be modeled before it can be analyzed. With these things in mind, some Hadoop experts have predicted the demise of the data warehouse. On the other side of the information divide, data warehouse experts think such claims are premature and fueled only by industry hype. Is each camp being myopic and vested only in furthering their own interests?

At this point, it's too early in Hadoop's lifespan to say if it will continue to complement or eventually fully replace the traditional data warehouse. Industry experts have complained that Hadoop lacks

some of the system monitoring, auditing, and maintenance tools that more mature databases have. We are beginning to see commercial versions of Hadoop address these shortcomings. As a number of examples throughout the book have illustrated, Hadoop has a sweet spot for certain unstructured data (Constant Contact), streaming data (Netflix), and low-cost storage (University of California Irvine). As data scientists try to access and analyze that data, they currently will write their own programs, a sophisticated skill that most BI experts lack. Relevant data may be loaded into an optimized engine (whether a BI tool's in-memory layer as King.Com or Macy's do) or into the data warehouse or analytic appliance to allow for faster, broader, and deeper analysis. In this regard, independent analyst Richard Winter of Winter Corporation, who specializes in data warehousing scalability, published a report that compares the total cost of ownership of Hadoop and the traditional data warehouse using parallel processing.⁷ The difference in cost was mostly driven by the type of analytics performed. For example, in his first scenario, both types of technologies were used in what he calls a "data refining" application in which 500TB of data with rapid throughput of sensor data were required. In the data refining example, Hadoop had a lower cost of ownership. The second use case is for a range of users and query complexity in a financial services industry, also comprising 500TB of data. In the financial analytic scenario, the traditional data warehouse had a much lower total cost of ownership than Hadoop. Beyond Winter's research, I think it is telling that early Hadoop adopters such as Facebook have also added traditional data warehousing into their analytic ecosystem.

Beyond the considerations of storage, cost, computing, and analytic workload that drive the debates of when to use Hadoop or data warehousing, there is also the issue of data cleansing. Some of the same conceptual differences in purposes for an operational system and an analytic system described in Chapter 2, Table 2-1, also apply to the Hadoop versus data warehouse debate.

The bottom line: In the near term, I don't see Hadoop replacing traditional data warehouse technologies and analytic databases. I continue to see it as complementary and just one potential part of that analytic ecosystem.

Privacy in the Age of Big Data

In the era of big data comes an enormous responsibility for anyone who generates, captures, stores, and explores data. Use the data wisely, and

your efforts will be rewarded. Use the data recklessly, and there will be a backlash on data integrity, privacy, and viability.

The case of National Security Agency (NSA) worker Edward Snowden has shown how privacy in the age of big data is a work in progress. Snowden revealed that the NSA has been spying on U.S. citizens and other countries by monitoring phone calls made abroad. The project, named PRISM, is intended to protect the United States against terrorist attacks. While there has been a certain level of masking of individual phone calls, most experts say that the degree of granularity and scope of phone calls tracked were excessive. No matter where your opinion falls in this debate, most would agree that our digital footprints are larger than ever before. Even analytically savvy companies are collecting more data than they, as of yet, know what they will do with.

For retail customers, a loyalty card transaction, past purchase, or a “like” on a Facebook page may generate a personalized coupon. Some retailers are beginning to use the built-in global positioning system (GPS) on a smartphone to generate the coupon when that customer enters a store, or even a region of a store. Shopping in the candy aisle? How about a discount on that nice big bar of chocolate? Perhaps this is a generational thing, but I find this degree of personalization creepy. My teen children assume such coupons are spam. My husband, on the other hand, thinks such personalization is cool, particularly if the coupon were to appear in the steak aisle at Costco. But he’s a technical neophyte and doesn’t seem to get those deals. A friend of mine who also works in IT routinely deletes his browser cookies and never, ever turns on location awareness on his phone. Lucky for him he’s never lost his phone! I’m careful about sharing too much data, and despite that, I still get the creepy text messages on a cell phone number that I use only for personal calls. Someone, somewhere probably didn’t protect my cell phone number as carefully as they should have.

It worries me too, that in talking about data and privacy with a medical doctor, he said he hesitates to put some patient information in an electronic medical record because such data gets shared more rapidly than paper files once did. If people—whether doctors, teachers, or business people—intentionally omit data that may be relevant to a diagnosis or a decision out of fear of how that data will eventually be used, there is an enormous downside. In everything, the benefit of providing or omitting the data has to be weighed against the risk, and the likelihood that the data would be lost, stolen, or used inappropriately. This same doctor suggested the U.S. government needs a new cabinet position, that of a

chief data officer, to help organizations more safely store and share data. It's an interesting thought—agriculture and transportation have some oversight but not the data that fuels the new economy. The flip side, of course, is fear that such a government involvement might stifle, rather than foster, innovation in this area.

This range of views shows that privacy concerns will vary by age, knowledge of what's happening, and the value provided to the customer. If customers and business partners are willing to provide you with private information, you need to protect that data and treat it as a limited resource, the "new oil," as it were.

Evolving Your Capabilities

Technical innovation is only one aspect that will help increase BI's prevalence. In discussing future plans with many of the case study companies, much of their concern was not about technology, but rather, in finding new ways to use BI to address common business problems. For the more large-scale deployments, some expressed concern about managing the risk of making any kind of major change to such a business-critical, complex application. With success, of course, come greater demands on the systems and the people. Ensuring an effective way of prioritizing competing requests warrants constant attention. One business leader expressed frustration at his department's inability to make wise investments, while witnessing other departments working in more unison and getting more value from business intelligence. Yet he remains optimistic that his business will get there and that BI will be the first thing people look at, even before e-mail. "To have one screen I can get to with a single click that shows sales, margin, price, opportunities in graphical form, with drill-down—that would be magic!" His comments remind me that the technology is sometimes the easy part; getting the organization aligned is harder. Even the most successful BI companies, then, continue to have their battles.

Industries, companies, and individual departments and business units will evolve their BI capabilities at different paces. No matter where you are on your BI journey, you have to evolve the people, treatment of data, processes, and technology. It's easy to fix the technology. It's much harder to change the people and culture. Use the model in Figure 14-6 to assess where you are today and to develop a roadmap for your future BI capabilities.

BI Maturity Model

	Report Centric	Early BI	Maturing BI	Analytically Savvy
People, Culture & Organization	<ul style="list-style-type: none"> Gut-feel decision making 	<ul style="list-style-type: none"> Individual departments dabbling with BI Executives and managers do not allow data to be shared until fully vetted BI used only by power users Fact-based decision making valued but hindered by poor data access 	<ul style="list-style-type: none"> Executives support broader BI initiatives BI teams struggle to keep pace with demand, conflicting priorities Reactive Data Governance 	<ul style="list-style-type: none"> BICC with business alignment and cross-staffed teams Proactive Data Governance Executives use BI as well as frontline workers Hypotheses backed by facts; alternative views encouraged Business uses self-service BI; IT handles complex requests. KPIs provide organizational alignment
Process	<ul style="list-style-type: none"> Reports provided by operational systems 	<ul style="list-style-type: none"> BI needs considered in application design First-in, first-out prioritization Backlog of reporting requests Waterfall development 	<ul style="list-style-type: none"> Transparent process for new and enhancement requests Project oriented BI productivity measured Agile development 	<ul style="list-style-type: none"> Proactive alignment of BI to business goals BI experts involved in business problem solving Program approach Value-based prioritization
Data	<ul style="list-style-type: none"> Data quality unknown Data captured but not used beyond operational process 	<ul style="list-style-type: none"> Poor data quality Inconsistent master data Data quality considered an IT problem Silo'd data marts 	<ul style="list-style-type: none"> Good data quality Uni-directional MDM for some reference data Data standards and common business definitions being developed Centralized data warehouse with dependent and independent data marts 	<ul style="list-style-type: none"> Data validated at source Bi-directional MDM External and internal data considered strategic assets Business glossary and data lineage accessible
Technology	<ul style="list-style-type: none"> Multiple ERP systems Reporting only within operational system Overreliance on spreadsheets 	<ul style="list-style-type: none"> Standardized ERP system per functional area, business unit, or region Custom, hand-coded ETL Business query and production reporting tools from multiple vendors deployed 	<ul style="list-style-type: none"> Commercial ETL tools Standardized BI platform Standardized metadata platform Variable query performance 	<ul style="list-style-type: none"> Consistent ERP approach Analytic eco system that includes EDW, analytic database, Big Data as needed Fast query performance Right tool for right user with BI platform complemented with specialty tools to include self-service, dashboards, predictive, visual discovery, and mobile BI

Figure 14-6 A model to benchmark your BI maturity

Words of Wisdom

I hope this book will inspire you to ensure BI and data have a profound impact on your organization. I'd like to see the techniques and insights shared by the most successful BI companies and the innovations from leading and niche vendors help move the industry beyond the current average of 24 percent adoption, 24 percent very successful, and 34 percent significant impact to much higher rates. Business intelligence is all encompassing in its ability to improve an organization's efficiency, competitiveness, and opportunities. Through the process of writing and researching this book, these business intelligence visionaries have assured me that this way of thinking is not just analyst-speak or vendor hype; it can be a reality. Following are some words of wisdom that I hope will inspire and guide you as you strive to make business intelligence a wild success in your company.

“Slicing and dicing the data has to be easier—easier than picking up a piece of paper. Even then, there is an education that needs to happen—getting people to *think* business intelligence.”

—Dr. Ray Iannaccone, vice president of operations,
Emergency Medical Associates

“Make your first BI solution embarrassingly small in scope and build to the biggest pain point.”

—Mike Masciandaro, business intelligence director,
The Dow Chemical Company

“Strong management and a cultural change have most contributed to our success. The CEO got Norway Post to be more business oriented, and the CFO drove the management system. In adopting this cultural change to one of accountability, sometimes we had to change the people.”

—Dag Vidar Olsen, former manager Business Intelligence
Competency Center, Norway Post

“To our surprise, the applications and markets we serve are much larger than we envisioned and we are now an integral part of the global transportation market. As we retool our platform to take full advantage of new technology such as NoSQL, cloud-based processing and distribution, and big-data analytics, we believe we will continue to grow the market by supporting even more use cases.”

—Jeff Kennedy, CEO, FlightStats

“Our business intelligence initiative has been a terrific success in the way we can optimize our team and the greater sense of control of the business. We are always tweaking things. Before, too many decisions were based on assumptions, generality, anecdotal, off the gut. It’s made us more agile as a company.”

—*Dave Walker, vice president of operations, 1-800 CONTACTS*

“Data should not be a substitute for business decision-making, but rather a torch to help illuminate which business actions are likely best.”⁸

—*Jesse Harris, chief analytics officer, Constant Contact*

“Start small and prototype. Data is where it’s all about, not the technology. The outcomes of the data drive the decisions and the growth. Establish clear data governance and usability. Get the top people in this space. Consider both the soft and hard skills.”

—*Mike Hedges, chief information officer, Medtronic*