BeyeNETWORK

Global coverage of the business intelligence ecosystem

Ease of Use

and

Interface Appeal

in

Business Intelligence Tools

BeyeNETWORK Research Report

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Executive Summary

Just as the eyes are the window to the soul, business intelligence (BI) tools are the window to the data that helps business users identify new opportunities and make fact-based decisions. Despite the critical role that BI tools provide, adoption remains low and BI tools are considered difficult to use, with largely unappealing interfaces.

Assessing a BI tool's ease of use is difficult, because it is influenced by subjective factors. However, the importance of ease of use — rated even higher than specific tool capabilities and analytic power — makes it a critical aspect to address in making BI more pervasive and with bigger business impact. Each group of potential BI users — whether power users who work with data for most of the day, or casual users who only have a short time to glance at information — brings their own set of experiences and expectations to a BI tool. Customers and vendors alike need to consider these differences so they can improve ease of use, leveraging whichever innovation is appropriate for a particular type of application and user segment.

Currently, BI tools are rated as some of the most difficult to use relative to a variety of technologies including Google, email, and Excel. Power users rate BI tools as more difficult than casual users. Companies who described their predominant BI tool as very easy to use had a much higher BI adoption rate than those who described their BI tool as only somewhat easy or difficult.

An appealing interface provides a powerful first impression, particularly when trying to embrace new users. The way a product looks and works influences how pleasant and effective it is to continue using a particular BI tool. With BI, a cumbersome interface and workflow competes with other ways of working, whether gut feel decision making or asking the expert. If someone doesn't have to absolutely get to the data to do their job, an unappealing interface can be a barrier to continued use. In considering various interfaces within a BI platform, the authoring interface is rated the least appealing. Dashboard interfaces rated the most appealing, but still leave room for improvement.

In trying to address ease of use and interface appeal, vendors have introduced a number of innovations such as BI's integration with Microsoft Office, in particular Excel, Adobe Flash animation, and BI search. Of these innovations, Microsoft Office integration is the most widely adopted. Lackluster adoption for other innovations is mainly because customers have not purchased the option.

Despite claims that BI tools should be easy enough not to require training, most people want some training, at least half a day. Even if the BI tool is easy to use, understanding the data requires time and explanation. A bigger issue is in the gap in the amount of training a person feels they should have and what they actually get. People who think their job requires a day or two of formal training are generally getting that training. However, BI experts and managers who say half a day of training should be required are not receiving any formal training.

What Makes BI Easy and Appealing?

Ease of Use is Important but Subjective

Ease of use is a much-touted BI requirement but one that is highly subjective and not well understood. As a BI tools expert, I usually find learning new BI tools relatively easy. However, ask me to take over the Xbox controls and I am lost, while my son will "click" away, without, of course, having ever read a manual. One person's "easy" is another person's "difficult."

Some BI tools seem harder to use than others, and certain tasks require more clicks in one tool versus another. Number of clicks to accomplish the same task could perhaps be an objective criterion in assessing ease. And yet, even that is not quite indicative of ease of use, because we could only measure one task, say building a query. We really want to assess (but can't) is the whole picture: how many clicks and how much time does it take for a business user to arrive at a particular insight. Beyond number of clicks in the BI process, the degree to which a tool is considered easy to use is highly influenced by our own set of skills, experiences, and expectations.

For these reasons, in assessing ease of use, one needs to consider not only the BI tool itself, but also differences among potential users. Differences such as gender, age, and job type will influence how easy a tool is considered to use and learn.

As an example, the younger generation may find playing songs on an iPod easy. But give them a record player and playing music will be a challenge, let alone skipping tracks (you pick up the needle, for those who don't recall). The reverse may be true for someone who grew up with record albums. As an industry, BI is still relatively young, having emerged in the early 1990s. A portion of the work force that has grown up with computers and easy access to information may have a different view of BI than workers who once relied on paper and colored pencil to create insightful graphs. Age is not the only differentiator of how people view BI. Job role too will affect how easily BI is perceived. An IT developer, understanding databases, load volumes, and the complex SQL behind the scenes, may be more tolerant of dull interfaces, slow queries, and confusing toolbars than a sales manager who wants everything as simple and fast as Google.

A tool may be considered easy to use because it is familiar. With BI tools, that familiarity may come from other business tools they use. This is one reason why many vendors have added capabilities to allow users to access and interact with data directly from a Microsoft Excel spreadsheet. An Excel-like interface to BI is ideal for those users who are data analysts, already comfortable in Excel. For front-line workers and managers who don't spend their days crunching numbers in a spreadsheet, such an interface is overwhelming. A Google or email interface to BI may be more appropriate for this segment.

People who spend less time analyzing data as an everyday part of their jobs will be influenced by other interfaces and office tools than Excel. Google is considered an easy-to-use, simple interface for accessing information. In 2006, when Google announced an enterprise version of its popular consumer interface, a number of BI vendors thought this type of interface would be an answer to ease of use for

casual BI users. They promptly released Google-like interfaces, a term the industry refers to as BI search. Other vendors and users remained skeptical that such a simplified interface would solve the ease-of-use challenges. Given the different influences on ease of use, it would seem that there is not one single silver bullet for easier BI. Instead, improving ease of use will involve multiple approaches. The approach that will most resonate for a particular BI user and application will vary because of all the unique influences each user brings to his or her BI experience.

While there are not many absolutes for ease of use, the following findings are consistent:

- Ease of use is very important
- Ease of use is subjective and influenced by a user's prior experiences and expectations

A solution is easy to use when:

- It is familiar, because it works as expected and is similar to another tool with which a user has experience.
- It takes less time and fewer clicks to accomplish the ultimate goal. Routine tasks may be automated and personalized.
- It is intuitive and obvious in how a task can best be performed.

Ease of Use Matters Beyond the Business User Interface

When I first embarked on this study, my expectation was that ease of use was primarily a concern for the business user. After all, the businessperson is the ultimate BI customer, the decision maker who most needs easy access to data for decisions and insights. However, the customer case studies highlighted that while ease of use is indeed a key requirement in the business user interface, ease of use for IT to deploy and enhance the BI environment is also critical.

When IT struggles to access, prepare, and present data for analysis by business users, it's a show-stopper. For example, Alco Industries, a Canadian distributor and manufacturer of aluminum fencing, has limited IT resources. Data locked in the accounting system was only accessible via fixed reports built by IT. Alco Industries wanted a more interactive, self-service BI environment, but deployment effort and costs for traditional BI tools were prohibitive. Alco Industries selected Indicee, a software-as-a-service (SaaS) BI solution. The SaaS model brought ease of use for IT; there is no hardware for IT to acquire or support. Because Indicee automatically creates an OLAP cube by detecting data relationships and then creates prebuilt reports, ease of building an initial environment also required less resources. Likewise, an example from Dorel Industries, a global manufacturer of juvenile products. With facilities in 17 countries and three major business segments, the decentralized structure of the company made getting a consolidated view of the business and of the data a challenge. Using IBM Cognos 8 Data Manager, the ease in which data from multiple data sources could be extracted, transformed and loaded into a BI environment was a decisive factor in making BI possible at Dorel's headquarters.

Taking this into account, customers and vendors should consider ease of use across the full BI life cycle for various stakeholders and user groups, including:

- Ease to deploy and enhance a BI solution, most important for IT personnel. While this group of stakeholders may be willing to tolerate a greater degree of "pain" in the BI process, easing their workload and helping them do more with fewer resources will allow them to deliver more BI and better serve the business.
- Ease to create BI content such as reports and dashboards, most important to IT personnel and business power users.
- Ease to interact with, explore, and consume BI content such as dashboards and reports, most important to business users and the final decision makers.
- Ease of making insights once the data is accessed and presented, most affecting decision makers who may not even use a BI tool today.

Interface Appeal: Fluff or Substantive?

They say "beauty is in the eye of the beholder" because beauty, like ease of use, is subjective. What is considered aesthetically pleasing in art, architecture, fashion, and computer design varies greatly. It seems that the degree of symmetry and themes from nature consistently increase the degree to which people consider something beautiful. But beyond that, perception of beauty changes with culture and time. For example, the Renaissance painter Botticelli would have found today's beauty standard for skinny women rather unattractive compared to what was then a plumper norm!

So the degree that a BI interface is considered appealing or not is hard to evaluate. When crafting the survey, in our first draft, I initially gave survey respondents the option of assessing an interface as "ugly" versus "very appealing." There were concerns that survey respondents and vendors alike would find this categorization offensive. So we agreed on a range of "very unappealing" to "very appealing."

The degree to which an interface is appealing will most affect the first impression for a new BI user. With BI adoption rates beyond power users low, first impressions matter. An appealing interface can help engage a new user. An unappealing interface becomes yet one more barrier to pervasive BI.

Beyond that first impression, interface appeal can affect the degree to which someone enjoys to continue to use a particular BI tool. For power users who must have access to the data, there is a higher degree of tolerance for unappealing interfaces, sometimes because they have little choice; their jobs require data access and manipulation regardless of whether or not the process is enjoyable. An appealing interface, then, simply makes the experience of using a BI tool more pleasant on a day-to-day basis.

Similar to the saying that "beauty is more than skin deep," interface appeal is not only the design and appearance of the BI interface, but also encompasses how the BI product works. An analogy of a sleek-looking sports car is appropriate. That first impression of a sports car may entice a driver. Speeding the

car along open stretches of a highway only adds to the appeal. Drive the same car on a mountainous, snow-covered road and that car is suddenly a lot less appealing! In this regard, appeal needs to be considered along with suitability for the type of business questions and analytic needs.

At Chevron, for example, the technology group and business users were not immediately clear about how they would use a newly discovered product, TIBCO Spotfire. They only recognized that it worked differently from their traditional BI tools and that it had the potential to help improve efficiency in their oil exploration. As business users could visualize and interact with their data in ways never before possible, they discovered more opportunities for efficiency and became even more passionate about the product.

BI Tools are Difficult to Use … for Everyone

According to the survey results, BI tools are not that easy to learn or use, even for people who spend the majority of their day accessing and analyzing data.

Compared to other technologies and office tools such as email and Excel, BI tools ranked near the bottom (See Figure 1), with only 23% describing their primary BI tool as very easy to learn and use. The only software that ranked harder to use is the internal transaction systems deployed to manage inventory, sales, purchase orders.

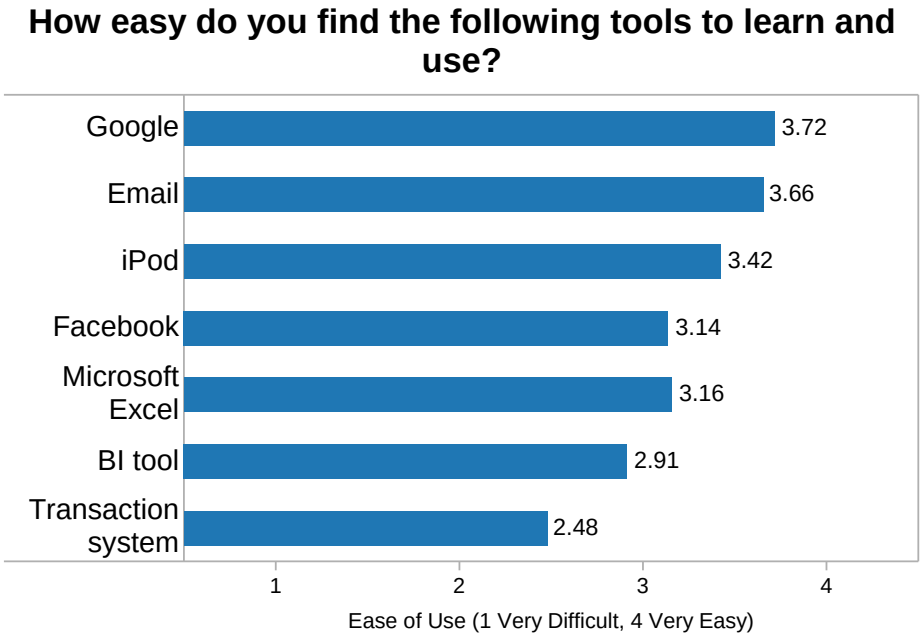


Figure 1: BI Tools are not that Easy to Learn or Use

This ranking sometimes changed depending upon gender and age. Male, older boomers (55+) found their BI tool easier to use than everything except Google. This is particularly true for those male boomers who have been using BI for more than five years.

The amount of training affected how easy someone considered their BI tool, but the relationship is not linear in that more training does not mean a BI tool is viewed as increasingly easier. Business and financial analysts who received a half day of training rated BI tools the easiest, compared to other job roles or training duration.

BI Adoption and Ease of Use

When BI is easy to use, it is more widely adopted. According to the survey results shown in Figure 2, an average of 27% of employees use BI. However, for companies that rate their primary BI tool as very easy to use, the adoption rate is significantly higher at 35%.

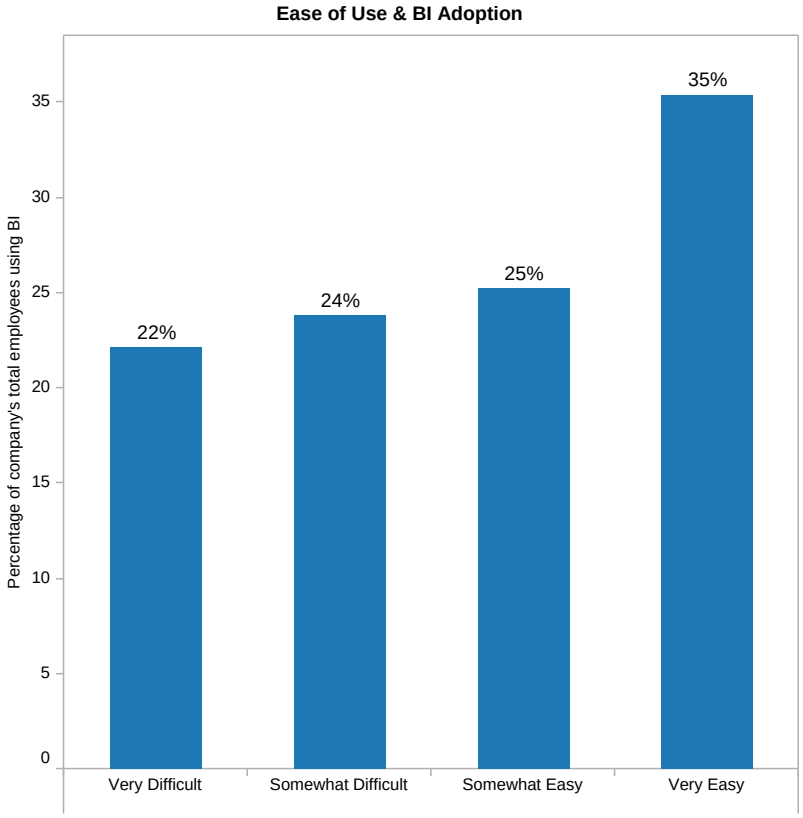


Figure 2: Adoption Rates Higher When BI Tool is Easy to Use

Barnes-Jewish Hospital (BJH), the largest hospital in Missouri, is a good example of how ease of use affects BI adoption. When implementing a new time and attendance system, BJH was looking for a solution that would be easy to use by all employees, whether administrators, doctors, or nurses. BJH selected Tableau Software because it allows users to create their own queries and visualizations with little support from IT. Within only a few months, 3,000 users were able to use Tableau, with little to no training.

BI Interfaces are Appealing … Sometimes

To assess interface appeal, we asked survey respondents to score various screens in a range from very unappealing (1) to very appealing (4). The survey included branching logic to direct respondents to screens that related to their role in BI. Therefore, information consumers were directed to BI start-up screens used for finding BI content and to various dashboards. BI developers and authors were directed to screens that showed authoring interfaces.

Logos from the vendor products were intentionally blurred. Resolution for the screens was approximately the same for all screens but was not as clear as if someone were working in the actual BI tool. In a perfect study, we would have controlled for data type, content, and software defaults; however, that was beyond the scope of this survey. We relied on vendors and sample applications for the screen shots.

Without these controls, these assessments offer some insight as to what people find appealing and unappealing but are limited in their accuracy. As well, because respondents could view only a single screen, the rating on appeal only pertains to the initial impression and not to the overall experience with a product.

If first impressions matter, in multiple products, the initial welcome page where users choose their reports or content is deterring. The one product that was rated more appealing had a greater use of color, icons, and information about each report or dashboard. Considering this, customers would be well advised to change the default start page to something other than a list of reports, a default in many products. At the very least, make a favorite report or dashboard the start page for information consumers.

Dashboard interfaces were generally well-rated with four products being rated appealing to very appealing, and only three products having a larger portion rated as unappealing. The dashboards that were rated higher had a greater use of brighter colors, in varying hues, and with gradients. One of the dashboards with the lowest rating used gray bars for charts, and tabular content that used a green-bar style background for alternating rows of data. The other least appealing dashboard certainly contained a lot of visual elements, but perhaps too much, with multiple spark lines, bullet graphs, often in gray.

Of the three components evaluated, the least appealing aspect was the authoring interface, with all five screens averaging below 3 or below appealing. The screen that scored the lowest had the most number of toolbars and icons on the tool bar. This suggests that while report and dashboard authors need capabilities, showing too much even to power users is overwhelming. Authoring interfaces that scored better had fewer toolbars and icons, and rendered the data values within the authoring interface rather than simply showing field names as placeholders.

Easy-to-Use BI is Very Important

Survey respondents were asked to assess the importance of various factors for BI to support more users, more decisions, and to better impact business performance. Not surprising is that data quality was rated the highest as shown in Figure 3 with 56% of survey respondents rating this as essential. On average, easy-to-use BI tools were rated the next highest, more so than specific tool features such as the ability to create calculations and crosstabs. 32% of survey respondents rated ease of use as essential to these BI goals, and 47% rated it as very important. The overall ranking of certain factors were closely rated, but it's noteworthy that personalization, with users controlling filters, sorts, and personalization was rated essential by 36%. This high ranking suggests users want more than just a static, production-style report that IT builds. In this regard, self-service BI should not be construed as users creating their own queries and reports but is better described as an environment that allows users to personalize the data they see, either automatically by role and job or by filters and sorts they can easily apply.

In both the survey results and case studies, customers indicated that the ability to combine data from different data sources is very important and frequently essential. As an industry, vendors take a variety of approaches to handle multiple data sources, with some tools allowing IT to address this requirement centrally, and other vendors giving the users more autonomy. Of the various BI roles considered, business and financial analysts rated this more important than other job types. There is no single correct approach, and even when there is a central data warehouse, business users continue to need to combine data from additional sources.

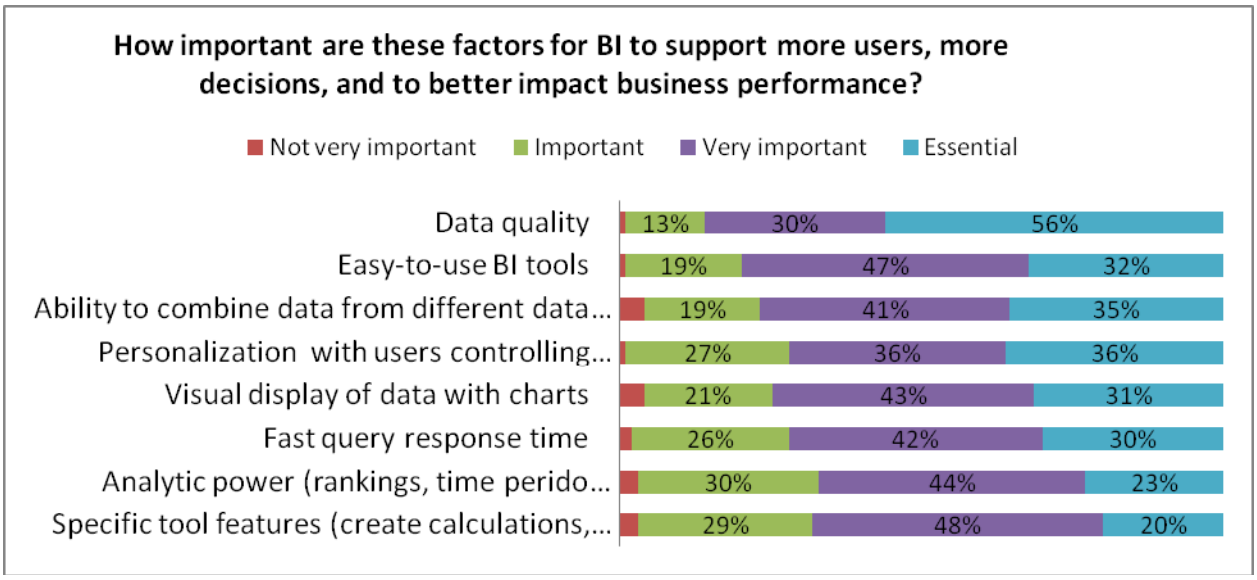


Figure 3: Ease of Use Ranks Second as Essential for BI Success

The degree to which BI tools are easy to use is often perceived as a barrier to pervasive BI. However, survey respondents feel strongly that if BI were easier to use, then BI would more greatly support

decision making and would enable people to spend more time on analysis and insight than on gathering data.

How someone defines ease of use is subjective, but it seems that the importance for ease of use also varies among different groups of users:

- Field staff and front-line workers rated ease of use as most important, even above data quality. Middle managers rated ease of use and data quality as equally important.
- Ease of use had a higher priority among people who spend more than 4 hours a day working with data. This last finding is interesting in that it is usually the power user types that the industry assumes is willing to tolerate a greater degree of difficulty in BI. It also confirms the perception that ease of use is too often sacrificed in exchange for more features, when it shouldn't be.
- Business and financial analysts gave ease of use a lower priority, fifth overall, and rated data quality and the ability to combine data from multiple data sources as most important.
- Visual display of data with charts was rated most important by people who spend only 1-2 hours a day working with data.
- Females rated analytic power such as rankings and time period comparisons of BI tools more important than males rated it, but still fifth overall.

Interestingly, ease of use does not follow the theory of Pavlov's hierarchy of needs — ease of use did not become less important even when someone considered their current BI tool as very easy.

Innovations that Improve Ease of Use and Interface Appeal

Vendors have tried to tackle ease of use and interface appeal challenges from different angles. There is no silver bullet in improving either aspect. Some innovations such as web-based BI, in-memory analytics, web-based deployment, and software as a service make BI easier for IT to deploy and maintain. The degree to which vendors offer free trial versions was often cited by case study customers as a way in which the customer could more readily evaluate and prototype a solution before committing to a purchase. A number of innovations specifically address ease and appeal for the business user. Three specific approaches considered in the survey were Microsoft Office Excel integration, use of animation, and BI search.

Microsoft Office Integration with BI

While many products initially began their Bi integration with Microsoft Office as a one-time export to CSV and Excel file formats, now a number of vendors allow users to work within a Microsoft Office application and query the BI environment using the Office interface. This integration is not a one-time export, but rather a live connection to the BI environment. For example, an Excel user can refresh

queries, drill and pivot from within a spreadsheet. Some BI products allow this direct BI access also via email, PowerPoint, and Word interfaces. As shown in Figure 4, 58% of survey respondents use these capabilities, the highest of any of the innovations surveyed.

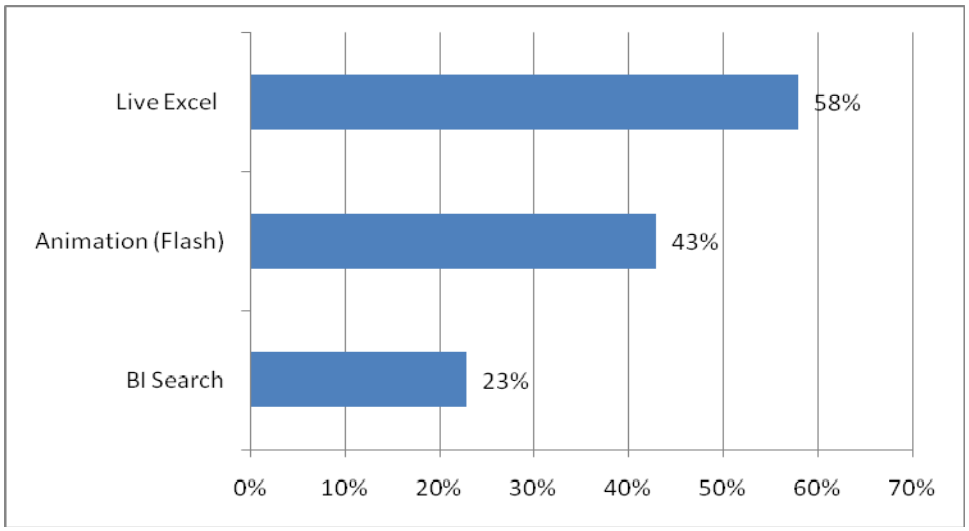


Figure 4: Microsoft Office Integration, Flash Inclusion and BI Search are Desired Capabilities

In addition to real-time Office integration, scheduled exports and email distribution are widely supported among BI products. At Cabela's, an outdoor supplies retailer, managing the merchandizing process from having the right products on hand to optimizing discounts is critical to company profitability and customer service. Cabela's selected MicroStrategy primarily for its ability to provide analytics without requiring IT to build a MOLAP cube. However, using the scheduling and email distribution capabilities within MicroStrategy, executives now receive a daily flash report with enterprise performance metrics, giving them timely and an at-a-glance view of merchandizing indicators. This aspect of their MicroStrategy deployment has become mission critical and BI adoption is high.

Animation

BI vendors predominantly use Adobe Flash to achieve animation, either within the interface or within a dashboard or report. Animation can be used for either visual appeal or to improve insight. For example, having a menu selector fade in or fade out (similar to the iTunes storefront, referred to as fisheye animation) makes for a more engaging and fun interface. However, imagine a line chart that displays sales. If that line chart actively moves up or down as the time period is expanded or narrowed, it's easier to see and remember the changing trend. A flashing indicator for a stock-out could draw a user's attention to that negative indicator.

While animation in reports and dashboards can improve appeal and insight, too much animation and superfluous animation can have negative consequences. Survey respondents who were not using these capabilities said animation could be distracting or make the dashboard look like a "cheesy web site." An IT developer in the banking industry said that users did not want to be entertained and only wanted

to see results. While such a mind-set may sometimes be valid, it is less valid if we consider BI's low adoption. Anything to improve how engaging and appealing users perceive BI removes a barrier to initial use. With these concerns in mind, animation should be more widely adopted, but as this aspect of BI gains traction, best practices for effective use of animation in BI should be developed.

One vendor that has had a positive impact from and makes extensive use of Adobe Flash is eThority. eThority uses animation not only for dashboard consumption, but also for navigating BI content, authoring, and exploration. Its clean and appealing interface proved to be a differentiator in several customer case studies.

BI Search

BI Search refers to capabilities that allow existing BI content, ranging from reports and dashboards to message queues and full data warehouses, to be indexed and exposed to an enterprise search engine. In some cases, users can use a search interface such as Google OneBox or IBM OmniFind to search existing content; in other cases, the search interface can be used to create a new query in plain English, such as "sales for 2009 in New York." Across the BI industry, vendor support for BI Search is mixed, with some vendors enthusiastically developing and recommending this approach, while other vendors claim it is overhyped. Of the innovations assessed, BI Search was the least adopted with only 23% saying they were using it. Even this number sounds high, however, and I suspect survey respondents instead were talking about the broadly used "Find" boxes within the BI portals rather than specific integration with enterprise search.

Training

The thinking goes that if BI tools were easier to use, then users would require little to no training. After all, how much training did you get on your iPod or on Google?

In reality, only a small portion of users (19% as shown in Figure 5) say no formal training should be required. 20% of survey respondents would like at least half a day of training. The gap between expectations and the amount of actual training received appears large. It would seem problematic that 37% receive no formal training, when only 19% think no formal training is appropriate.

In considering who expects no formal training and those who receive no formal training, the gaps are largest for IT developers and BI experts and for middle managers and executives, as shown in Figures 6 and 7 (job roles and training approach with insufficient data points were removed). At the other end of the spectrum, it is surprising that a large portion of managers expect to receive 1 to 2 days of formal training in BI tools as many BI experts (including myself) assume this class of users should require no formal training. It's not clear from the survey data if this is what managers and executives really want, or if it is what they have come to expect given the complexity of BI tools.

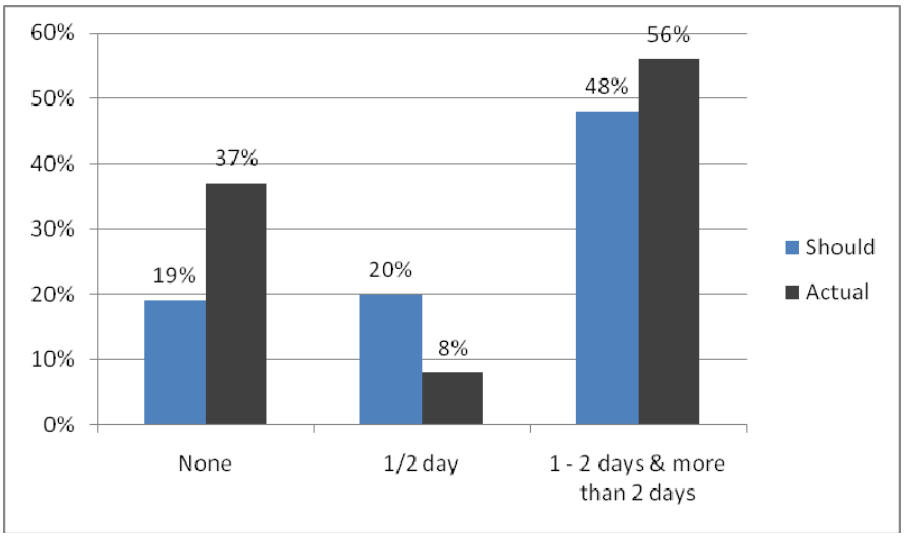


Figure 5: Desired Training Versus Actual

An easy-to-use BI tool allows customers to devote more attention to understanding the data versus learning the tool. DAKOTACARE, for example, provides health insurance to South Dakotans and also acts as a third-party administrator for other insurance providers. They selected QlikTech QlikView for its rapid deployment and easy-to-use dashboards. Learning the tool and how to navigate the dashboards only takes an hour to use, but they spend days on training to ensure people understand the data in those dashboards.

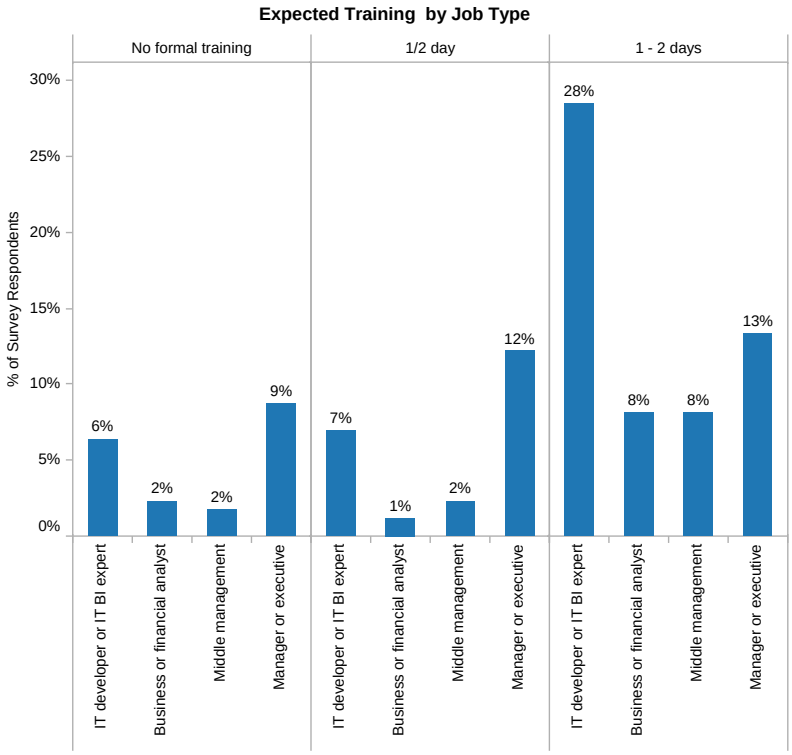


Figure 6: Expected Training by Job Type

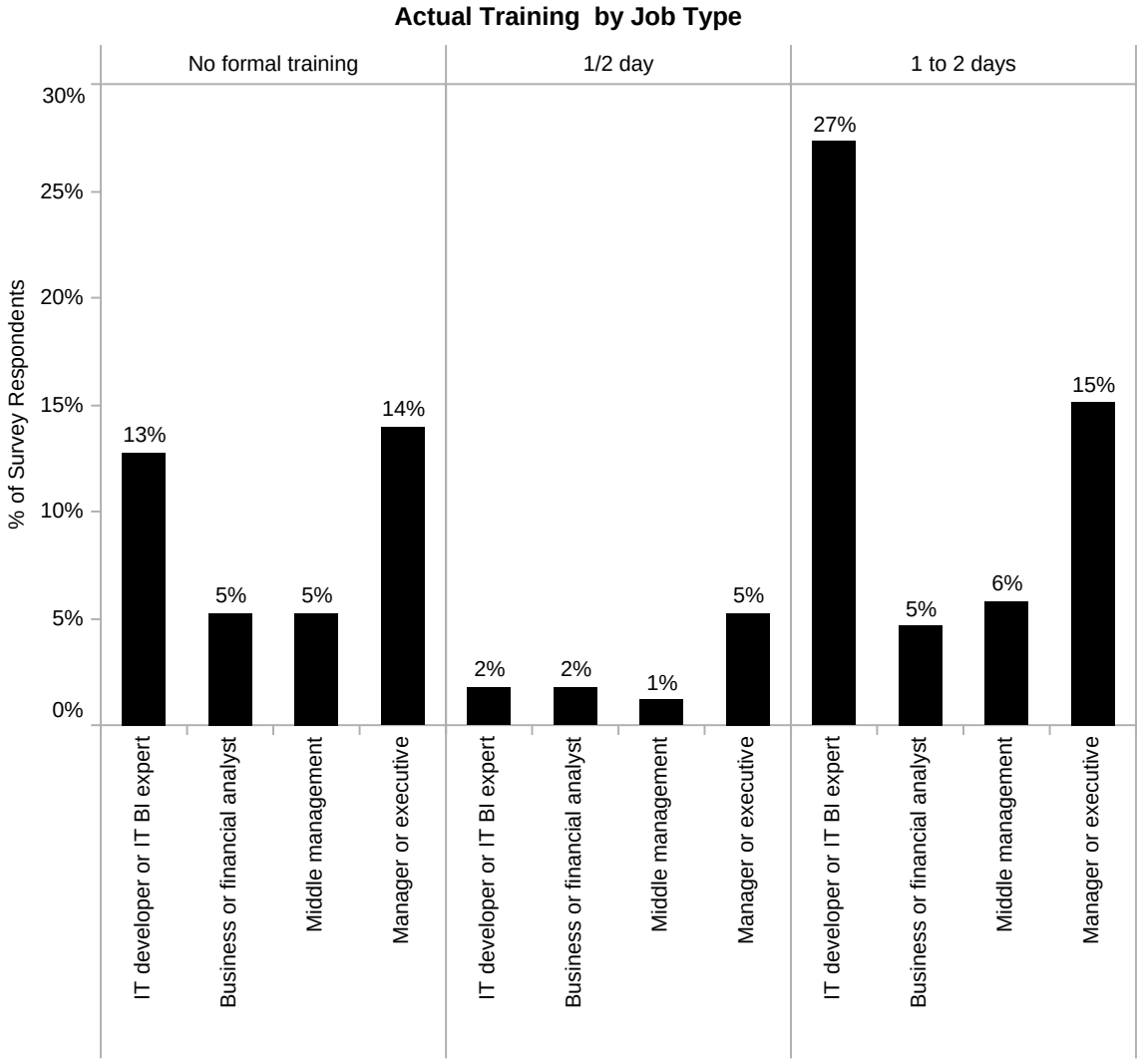


Figure 7: Actual Training by Job Type

Summary and Recommendations

Ease of use and interface appeal are important factors in making BI more pervasive, particularly beyond the power user base. These factors should not be viewed as "fluff" and of concern only to the most casual of BI users. When BI is difficult, more time is spent learning tools and on routine tasks than on using the data for insight and business improvement. It's particularly telling that easy-to-use BI tools are rated as more important than BI features and analytic power.

Despite its importance, vendors, BI buyers, and BI users must recognize that ease of use and interface appeal are subjective. Ease of use and interface appeal should be assessed during the buying process, but asking someone why they like a particular BI tool more than another is like asking someone why they like a particular painting more than another. Ease of use and interface appeal should be assessed across the full BI life cycle and considered for different groups of users and types of applications.

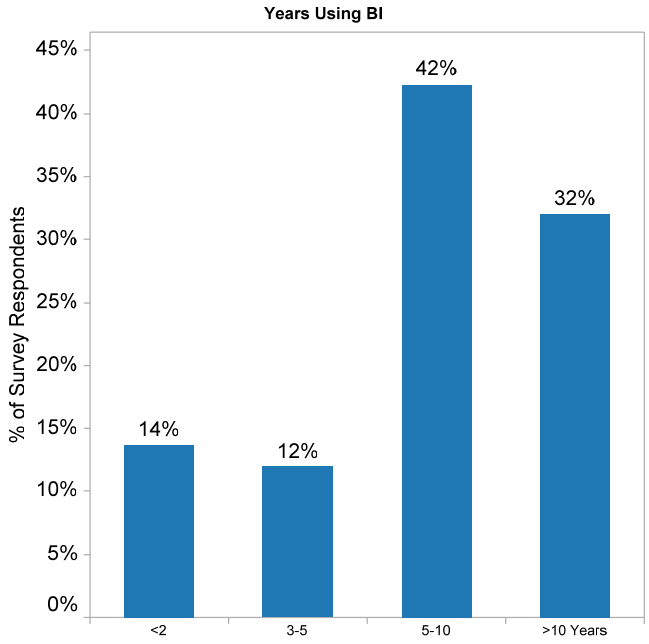
Visual appeal serves as a powerful first impression but also affects how much users enjoy working with a BI tool on a routine basis. For the most part, vendors have a long way to go to improving visual appeal in their BI products, particularly within the authoring interfaces. Dashboard interfaces were considered more appealing than other aspects, but indicate that best practices need to be established for more effective use of color and the amount of information someone enjoys having on a single page. Determining what people need to see may follow a formal requirements process, but determining how they like to see it may require a greater degree of intuition and art.

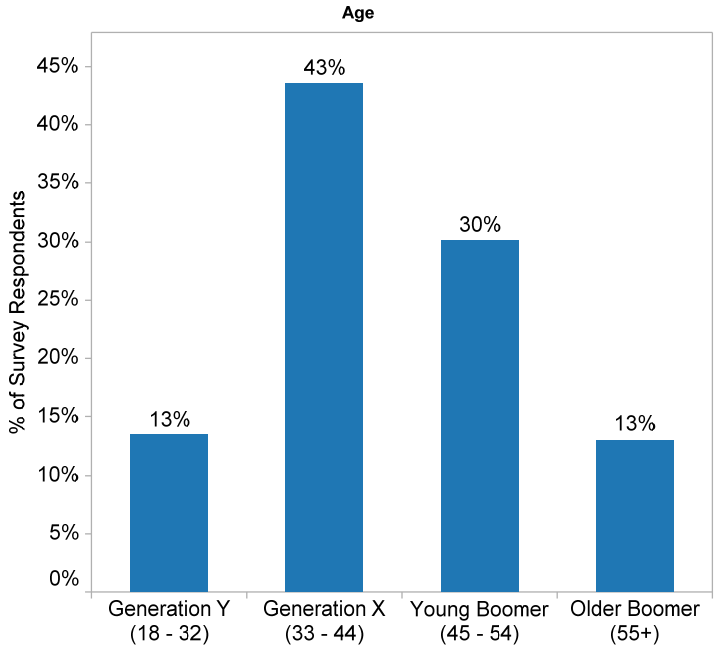
The BI industry has adopted a number of innovations to address ease of use and interface appeal. Customers should monitor these innovations and understand why some will resonate more with certain classes of users. However, with the exception of Microsoft Office integration, use of animation and BI search are not widely adopted. The most-often cited reason for not yet using these innovations is that the company had not purchased or deployed the capabilities. A large portion of respondents were not even aware the capabilities existed. This suggests that BI vendors need to do more to promote the capabilities and make them easier to acquire.

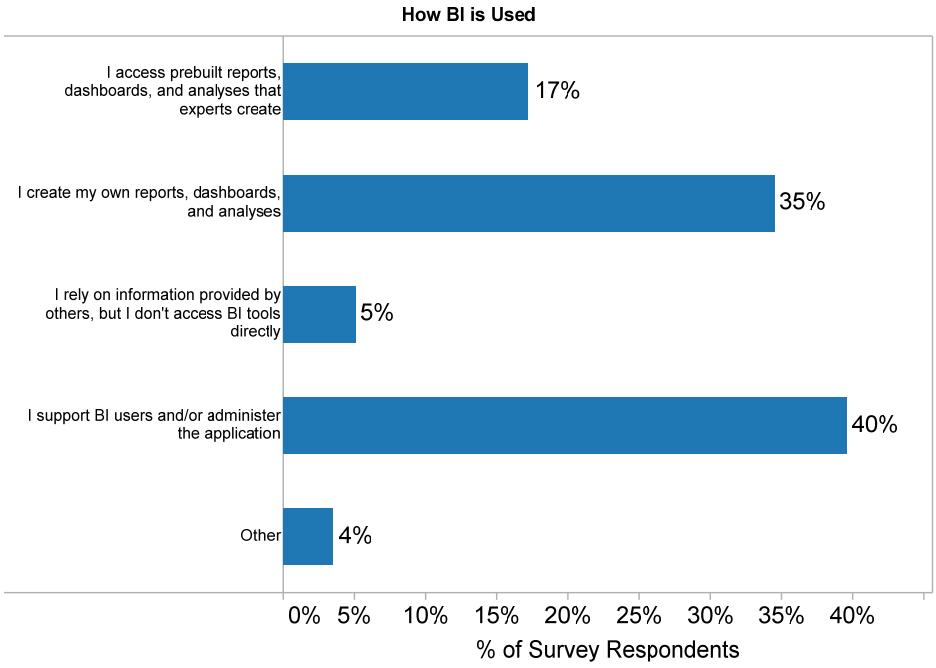
Training and expectations for what is a reasonable amount of training affects a user's perception toward BI's ease and usefulness. Customers should offer multiple training approaches and durations tailored to particular roles and job levels.

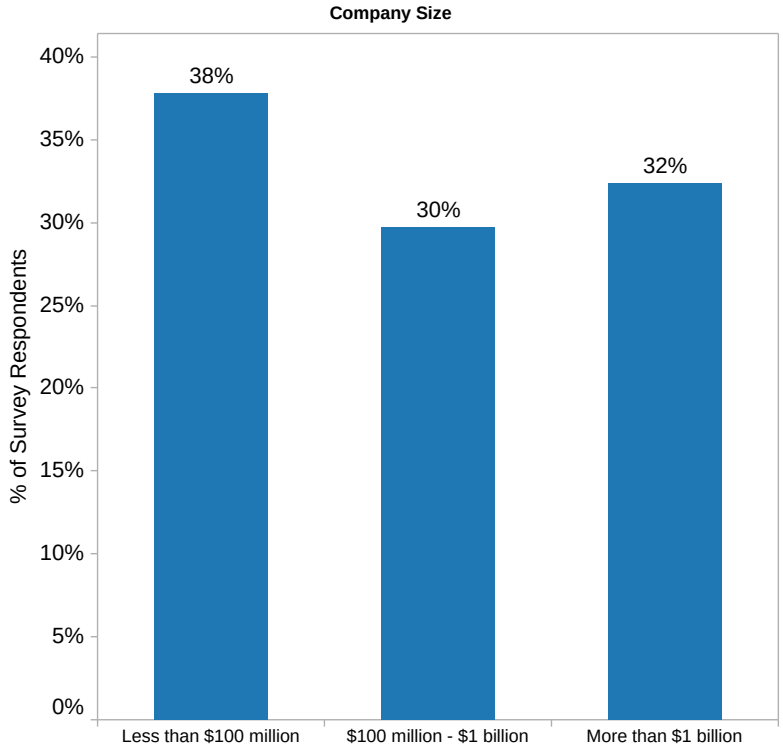
Survey Demographics

There were 255 valid survey responses. The following charts show the size of the respondent's organizations, their breakout by age, the role they play within the BI ecosystem and the number of years of experience.









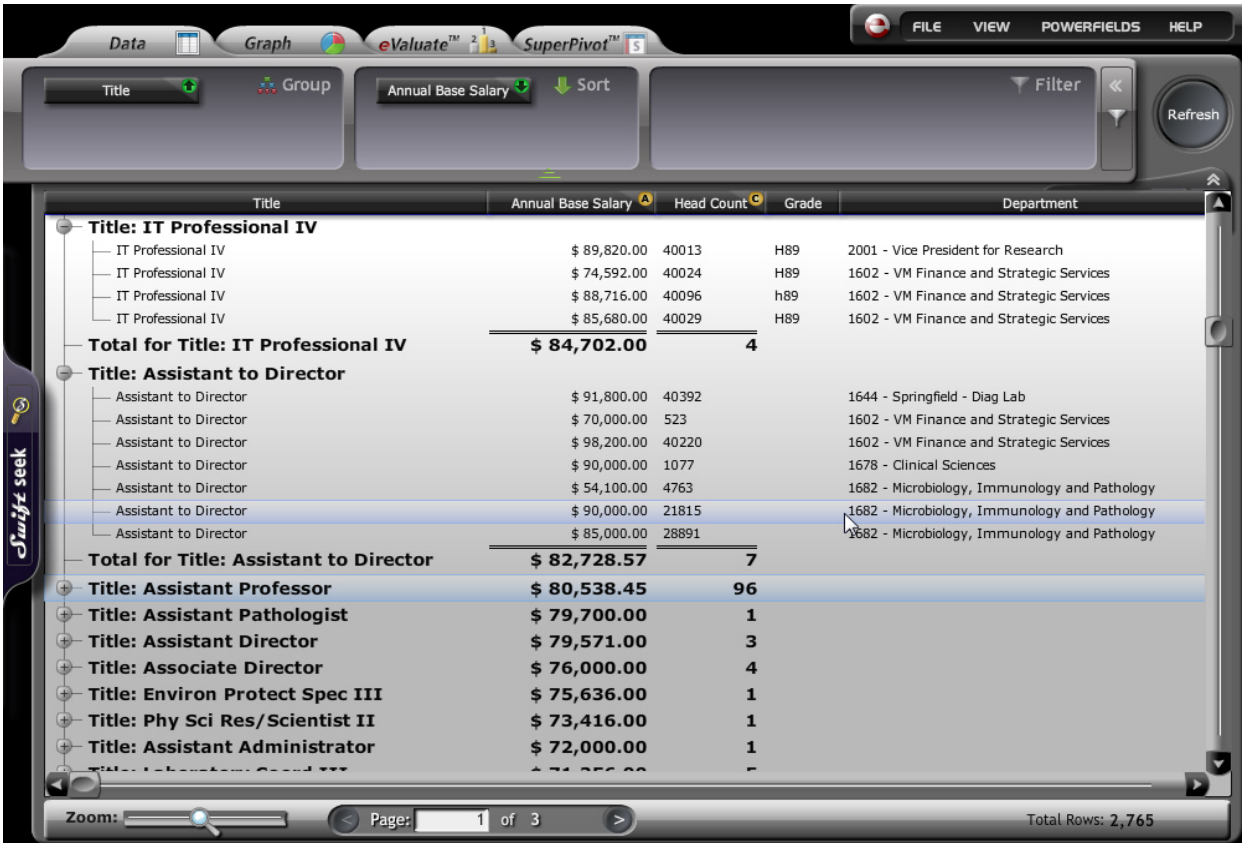
Vendor Product Overviews and Case Studies

eThority: Product Overview

eThority (www.ethority.com) is a privately held BI vendor that positions itself as a solution simple enough for departments to deploy but with an enterprise-class architecture and security. It differentiates itself on its "user-obvious" interface.

eThority uses a Flash-enhanced, web interface for both the data modeling and end-user environments. Data Conduits provide real-time connections to a relational data warehouse or directly to a transaction system. Information can also be extracted from spreadsheets, flat files, and web services, and then loaded into a SQL Server data mart.

IT or power users author Data Libraries that can connect to multiple data sources. eThority eXtensions are optional applications that allow for additional data capture from within eThority. This allows for data to be captured that is not part of the transaction system, but that is captured in a central way that ensures integrity. In this way, eThority can be used for budgeting, commitment management, and a host of other industry-specific needs.



Title	Annual Base Salary	Head Count	Grade	Department
Title: IT Professional IV				
IT Professional IV	$ 89,820.00	40013	H89	2001 - Vice President for Research
IT Professional IV	$ 74,592.00	40024	H89	1602 - VM Finance and Strategic Services
IT Professional IV	$ 88,716.00	40096	h89	1602 - VM Finance and Strategic Services
IT Professional IV	$ 85,680.00	40029	H89	1602 - VM Finance and Strategic Services
Total for Title: IT Professional IV	**$ 84,702.00**	**4**		
Title: Assistant to Director				
Assistant to Director	$ 91,800.00	40392		1644 - Springfield - Diag Lab
Assistant to Director	$ 70,000.00	523		1602 - VM Finance and Strategic Services
Assistant to Director	$ 98,200.00	40220		1602 - VM Finance and Strategic Services
Assistant to Director	$ 90,000.00	1077		1678 - Clinical Sciences
Assistant to Director	$ 54,100.00	4763		1682 - Microbiology, Immunology and Pathology
Assistant to Director	$ 90,000.00	21815		1682 - Microbiology, Immunology and Pathology
Assistant to Director	$ 85,000.00	28891		1682 - Microbiology, Immunology and Pathology
Total for Title: Assistant to Director	**$ 82,728.57**	**7**		
Title: Assistant Professor	**$ 80,538.45**	**96**		
Title: Assistant Pathologist	**$ 79,700.00**	**1**		
Title: Assistant Director	**$ 79,571.00**	**3**		
Title: Associate Director	**$ 76,000.00**	**4**		
Title: Environ Protect Spec III	**$ 75,636.00**	**1**		
Title: Phy Sci Res/Scientist II	**$ 73,416.00**	**1**		
Title: Assistant Administrator	**$ 72,000.00**	**1**		

eThority uses the concept of a DataBook, which business users author themselves. As shown in the figure, a DataBook has four main views: Data, Graph, eValuate, and SuperPivot. The product makes extensive use of Adobe Flash animation. For example, to browse quickly through millions of rows of data, there is a SwiftSeek function (on the left) that uses Adobe Flash fisheye, similar to the iTunes shopping cart. With the SwiftSeek, a business user can rapidly scroll through a long list of data elements via an appealing and intuitive interface.

The eValuate tab allows users to rank and visually compare a data point versus others, for example, to compare a student's grade point average versus another class or the university as a whole. eValuate includes statistical capabilities, trending, and distribution.

eThority has created in industry vertical-specific versions of eThority Enterprise, particularly higher education (DataScholar), human resources (DataTalent), and healthcare (DataMedic). These applications include prebuilt data models, reports, and dashboards, allowing vertical providers to embed BI capabilities.

Product Packaging and Pricing

eThority Enterprise is available in a traditional on-premises license, hosted environment, or as an appliance. eThority also offers both subscription and perpetual licensing models.

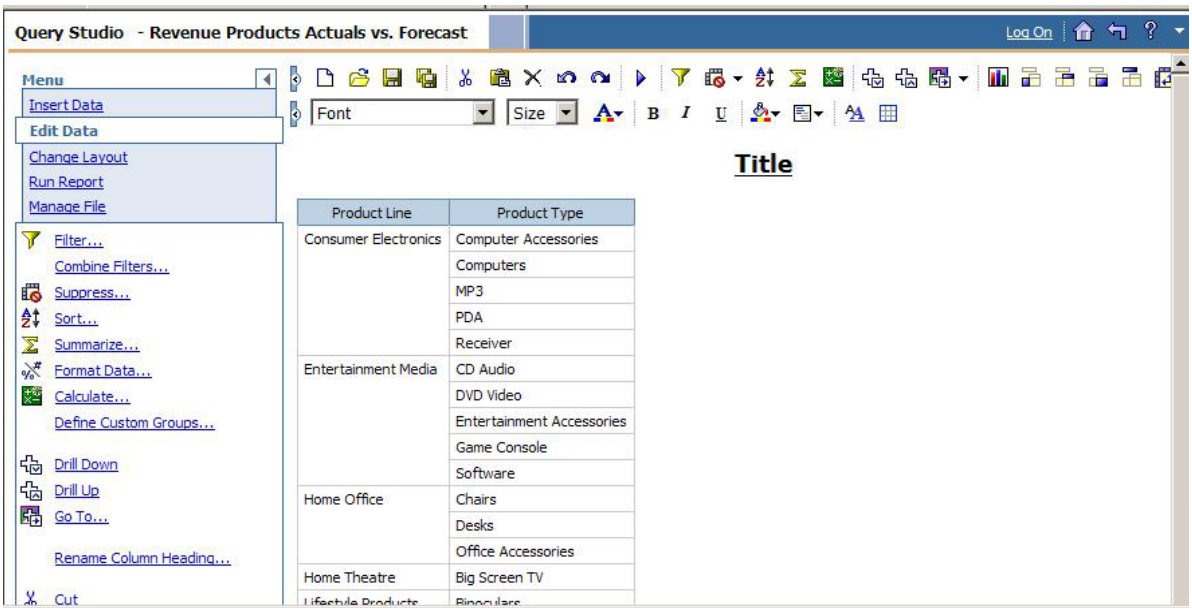
IBM Cognos Software: Product Overview

IBM Cognos Software (www.ibm.com/software/data/cognos) is a division within IBM. IBM had more than $100 billion in revenues in 2008.

IBM Cognos 8 BI

IBM Cognos 8 BI delivers a broad range of business intelligence (BI) capabilities that include reporting, business query, OLAP, dashboards, and scorecards built on an open services-oriented architecture. IBM Cognos Software differentiates itself as a pure web-authoring environment and in its focus on performance management. IBM Cognos Planning and IBM Cognos Controller are integrated with the IBM Cognos 8 platform.

To provide users with a business view of the data, an IT administrator builds a metadata model in Framework Manager. These models can access both relational and OLAP data sources, including native IBM Cognos Planning, IBM Cognos TM1, and IBM Cognos PowerCube cubes and third-party cubes such as Microsoft Analysis Services and SAP BW. Users then build queries using an interface tailored for the particular type of information requirement and user profile. Casual users create ad hoc reports in Query Studio (as shown in the following figure); power users and IT developers build pixel-perfect reports and dashboards in Report Studio; financial users create financial reports in Express Studio; and information workers can drill, pivot, and rank information using Analysis Studio.



In addition to these core capabilities, IBM Cognos Software offers a number of extensions to the platform. IBM Cognos Go! Mobile provides support for the BlackBerry. IBM Cognos Go! Search

provides a simple search interface and integration with leading enterprise search products such as IBM OmniFind and Google OneBox. IBM Cognos Go! Office and allow users to refresh reports from within Excel and PowerPoint, while IBM Cognos Analysis for Excel (CAFÉ) allows users to drill from within Excel against OLAP and hierarchical data sources.

IBM Cognos 8 Data Manager provides extract, transform, cleanse, and load capabilities from source systems to star schema data marts. Data is modeled into fact tables and dimension tables optimized for reporting and analysis. Models built in Data Manager can be exported to Framework Manager.

In addition to IBM Cognos 8 BI for enterprise deployments, IBM Cognos software recently released IBM Cognos Express for 25-user deployments and includes both BI and planning capabilities, leveraging TM1.

Product Packaging and Pricing

IBM Cognos 8 BI is licensed by named user according to various roles. Pricing for these roles is not publicly available.

IBM Cognos Case Study: Dorel Industries

Background

With headquarters in Montreal, Canada, Dorel Industries (www.dorel.com) is a global manufacturer of juvenile products and bicycles sold in more than 70 countries around the world. The company has three main business segments: juvenile that creates car seats, strollers, and highchairs under well-known brands such as Maxi-Cosi and Safety 1st; bicycles under brands such as Cannondale and Schwinn; and home furnishings that make housewares and ready-to-assemble furniture for home and office. The company has revenues in excess of $2 billion and has facilities in 17 countries.

Business Challenges

In late 2006, Dorel relied heavily on its decentralized divisions for corporate reporting. If an executive simply wanted to know, for example, how many booster seats were sold in a particular time period, he had to call multiple divisions located in Europe, the U.S., Australia, and Canada. Everything was submitted in spreadsheets. Getting a consolidated view of the company's financials was a manual process. At one point, the idea was floated that the company should go to one central ERP solution, but as the divisions operate somewhat autonomously, that idea seemed monumental and impractical.

The company began investigating using business intelligence (BI) to bring the disparate data sources together, led by Ian Farthing, Vice President of Corporate Services.

The executives wanted better insights into operational and sales data. Finance wanted to improve the financial consolidation process. While the concept of BI was new at corporate headquarters, it was not new at the divisions. Each division had various BI solutions, with different levels of maturity and adoption. So in addition to finding a solution that would appeal to a new user base at headquarters, Farthing also had to find a solution that would be accepted by divisions that had their own opinions about which BI tool would be best.

Ease of Use, Interface Appeal, and IBM Cognos Software

At the start of Dorel's evaluation, there were 6 vendors. This list was gradually pruned to three. The company asked each of the three remaining vendors to participate in a proof of concept. It was really the ease in which data could be loaded into IBM Cognos Software that set this vendor apart.

"Ease of use was very important," explains Farthing, "but it's also very hard to assess. The way we could load the data with IBM Cognos 8 Data Manager seemed like the best choice." Data Manager is an optional module of IBM Cognos 8 BI, providing dimensional ETL capabilities that are used to extract, load, and transform (ETL) data into a data warehouse for BI consumption. Since IBM's acquisition of Cognos in 2008, IBM's InfoSphere DataStage product may get top billing, but IBM Cognos 8 Data Manager continues to be ideal for targeted BI applications. Dorel's headquarters receives 12 daily feeds from the various divisions. IBM Cognos 8 Data Manager makes loading them into the BI environment straightforward, replacing all the manual processes.

Today, Dorel has over 100 BI users. Many business users access prebuilt reports and dashboards designed in IBM Cognos 8 Report Studio. Lina Tjiu, the company's BPM systems analyst, explains that the ability to customize in Report Studio makes for an easier interface for report consumers. "We want to reduce the number of reports, so our standard reports include a lot of drop downs." Users can drill and filter by simply navigating the drop-down menus.

Dorel also uses IBM Cognos 8 Query Studio for ad hoc reporting requirements. For example, the tax department may create a one-time report to see how much product was shipped out of a particular state. Before, one person would have to call each division and manually add up the sales figures to arrive at a combined total. Query Studio only requires that users have a brief, one hour training to allow them to begin using the tool.

IBM Cognos 8 Go! Mobile has also been a big win for executives who travel. With IBM Cognos 8 Go! Mobile, executives can have timely access to reports via their BlackBerrys.

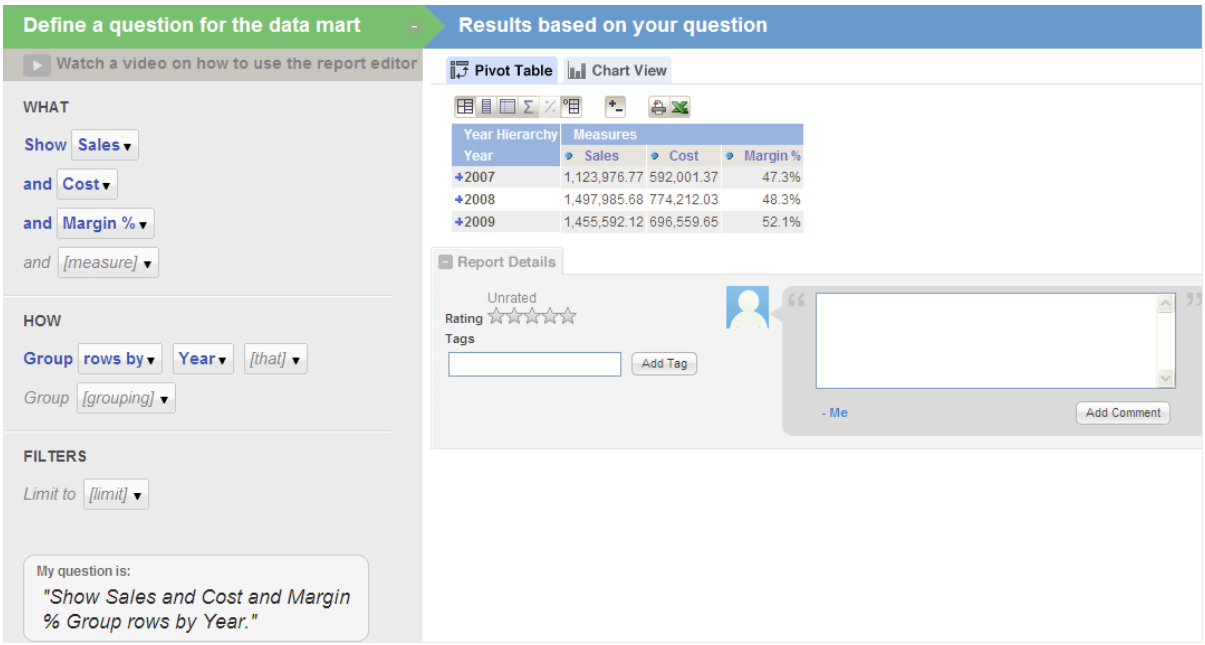
While the BI deployment at Dorel has been a success, Farthing still sees many opportunities to extend BI's value. "The challenges with BI are not technology-centric. BI is meeting our basic needs so nobody is pounding on our door for more. My team needs to set the BI agenda, because we know what's possible. As we get more data out there, users get more excited, and we have more adoption. It's like a snowball that is rolling slowly but is gaining speed."

Indicee: Product Overview

Indicee (www.indicee.com) is a software-as-a-service business intelligence (BI) solution. The company is privately held and was founded in 2006 by former Crystal Decisions founders. Indicee is a solution that positions itself as lightweight end-to-end BI, making it simple to both load data and to create reports and dashboards.

Indicee stitches together disparate business data and lets business decision makers ask questions, create reports, and share insights.

In order to load data into the system, Indicee can upload standard reports or data files from business applications, eliminating the need for direct database connections. There are also number of QuickStart templates that will extract data from accounting products most widely used by small to medium-sized businesses: QuickBooks, Sage, Microsoft Dynamics, and Softrak Adagio. These quick starts include both the extract, transform and load (ETL) processes and the prebuilt reports and dashboards. Indicee can also load data directly from Crystal Report files, spreadsheets, and CSV files. Data is loaded into a MOLAP database, based on the open source Mondrian engine. Indicee uses the Amazon cloud and is a multitenant architecture, meaning each customer accesses the same version of the software.



To address ease of use for business users, Indicee uses a guided, contextual interface for building reports. As shown in the following figure, Indicee will automatically generate reports based on patterns it finds in the data. The interface then uses simple questions such as what (What do you want to see such as sales, cost and margin?) and how (How do you want to view sales and cost, by product or time?). Each element in the interface includes a drop down so users can choose from other measures or dimensions that may be available in the data.

A business user can define a question, and the data is automatically displayed in the pane at the right. A pivot table allows for drilling to detail, adding subtotals, or exporting the data to Excel. The chart view provides a graphical representation of the data. Indicee includes collaboration features that allow users to tag, rate, and comment on particular reports or findings.

Packaging and Pricing

Indicee offers three monthly pricing plans:

- Free: single user, for up to 10MB of data
- Data jockey: $69 a month for single user, 100MB of data
- Work group: $149 a month for up to 5 users, 250MB of data

Indicee Case Study: Alco Ventures

Background

Alco Ventures (www.alcoventures.com) is a manufacturer of aluminum railing, screen doors, and fencing, and is a distributor of pellet and wood stoves. The company serves both professional installers and also has a line of do-it-yourself products for homeowners. Founded 25 years ago, the company is privately held, has approximately $17 million in annual sales, and is located in British Columbia, Canada.

The Business Challenge

Alco both manufactures and distributes products. This can make sales reporting complicated as manufacturer representatives, direct reports, and product managers all have different requirements. Alco uses Microsoft Dynamics for its sales and transaction processing. Canned reports from the transaction system are inflexible and only provide grand totals. Any requests for new reports had to go through the IT department. In 2008, the company began looking for a solution that would provide more flexible reporting at a low cost. The ideal solution would require limited IT resources.

Ease of Use, Interface Appeal, and Indicee

Ben Hume, president of Alco Ventures, had begun the process of looking at various BI solutions but was finding that they were expensive and would require a major installation effort. Ease of use in the BI tools was less of a concern because the company had no prior BI experience. The major barrier was the cost and getting a solution up and running.

President Ben Hume was introduced by a friend to Graham Ross who had recently joined start-up company Indicee as VP of Business Development and Marketing. Ross claimed they could get Indicee up and running in a few days. As a software-as-a-service (SaaS) product, Indicee would not require Alco to install any hardware or software. It's a pay-as-you-go, load-your-data-in-the-cloud product.

While Hume may have been skeptical, based on the reference he had been given and as an entrepreneur himself, he was willing to give Indicee a chance.

As promised, Indicee was delivering reports in a few days. Now the sales representatives, managers, and Hume have access to more granular sales information. New sales data is loaded into Indicee on a monthly basis.

"There was some resistance from IT to let go of the data," says Hume, "and they had a hard time admitting that they can't give you everything. But it was a huge relief that sales people aren't bothering them now for more data."

With Indicee, sales representatives can create their own reports and share reports. It offers slice-and-dice capabilities, without having to go through IT to formally design a report. Training only takes an hour.

As a SaaS product, the Indicee architecture made it easy for Alco to offer external manufacturers' sales representatives access to Alco's data. Indicee handles the security so that each representative can only see information pertaining to his products and customers.

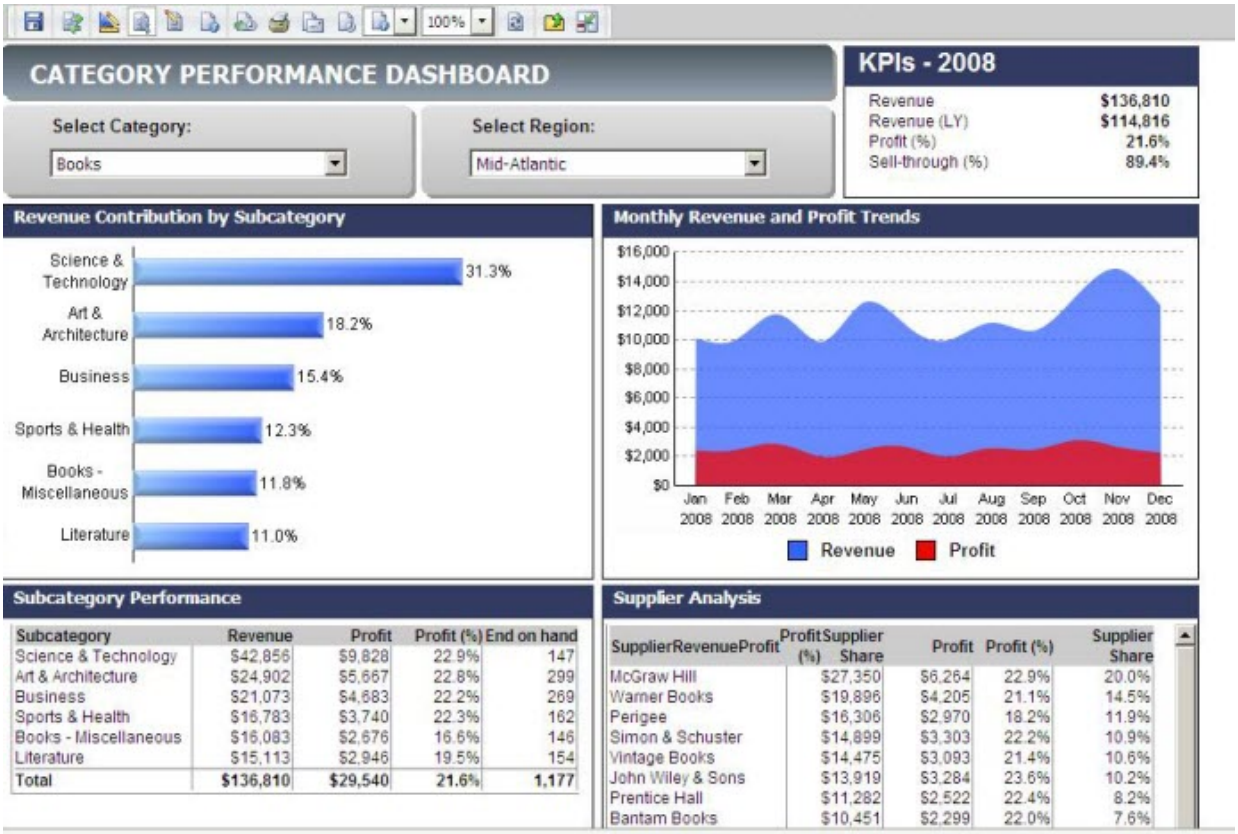
Says Hume," The price is right. The support has been phenomenal, and Indicee has been responsive to our requirements."

MicroStrategy: Product Overview

MicroStrategy (www.microstrategy.com) is one of the few remaining pure-play BI vendors that is publicly traded on NASDAQ. Its 2009 annual revenues were just over $377 million.

MicroStrategy offers a complete business intelligence (BI) suite that includes reporting, business query, OLAP, and dashboards. It most differentiates itself on its relational OLAP architecture that allows for complex analytic queries, without requiring data to be replicated into a separate MOLAP storage engine. An optional module, OLAP Services provides in-memory multidimensional cache for speed-of-thought analysis, but full drill down and pivoting is supported even without this optional module.

To provide users with a business representation of the data, an IT administrator builds a metadata layer in Architect. Architect provides pointers to the physical tables stored in a variety of relational databases. Users can build queries either via MicroStrategy Desktop or MicroStrategy Web. Both interfaces access the same metadata layer. When users issue a query, multiple SQL statements may be issued to retrieve the data. The MicroStrategy Intelligence Server determines if the query can best be served via cache, in-memory multidimensional cache, or from the relational database.



MicroStrategy Enterprise Dashboards are highly formatted reports designed in Report Services, as shown in the figure. These dashboards can be rendered in either AJAX or Adobe Flash to allow for animation and interactivity, even when disconnected from the Web. MicroStrategy Mobile allows for reports to be displayed on smartphones such as BlackBerry devices. MicroStrategy Narrowcast Server and Distribution Services provides for scheduled reports to be distributed via email, file and print.

Product Pricing and Packaging

MicroStrategy offers a free Reporting Suite version that includes basic business query and OLAP capabilities for up to 100 users. Additional versions are priced either on a named-user or CPU basis.

MicroStrategy Case Study: Cabela's

Background

Cabela's (www.cabelas.com) is a leading outfitter of fishing, hunting, camping, and outdoor supplies with more than $2.5 billion in annual revenues. It started as a family-run catalog company in 1961 and went public in 2004. The company now has 29 retail locations throughout the U.S., with one in Canada, and is one of the highest-ranked online stores.

Business Challenges

In a challenging economy, core to Cabela's business success is to optimize merchandizing. The company must continuously monitor gross margins on every product, minimize overstocks, and improve discounting.

Cabela's had a firmly established Teradata data warehouse and had invested in developing its data model. Hyperion Essbase was in place to provide some reporting, but changing the cube structure proved resource intensive. Cabela's wanted to provide a more self-service environment for business users. They tried to roll out Brio; however, users were hindered by their lack of knowledge in SQL. In addition, there were a lot of manual processes to get the data presented in a way that was useful. In just one example, someone spent 8 hours a month to cut and paste data from screens in a transactional application into spreadsheets.

In July 2008, the company began looking for a business intelligence (BI) tool that was easier to support and did not require users to learn SQL. "We wanted something that was easy to use, fast, and looked pretty," says Jeff Thorson, Senior Enterprise Data Warehouse (EDW) Business Analyst.

Ease of Use, the Interface, and MicroStrategy

Often when we talk about ease of use in the BI industry we think of the business users, but ease of use also applies to developers who can be a bottleneck in deploying a solution. Cabela's found MicroStrategy attractive because it did not require a MOLAP cube. MicroStrategy's relational OLAP architecture means that data does not have to be replicated and loaded into a separate storage area. Batch window processing is a non-issue. According to Thorson, "The object-oriented architecture makes development easy. We can put the metadata structure and metrics out there. Users can drill down and across without instruction."

One of the most successful components of Cabela's deployment is a daily flash report that contains enterprise performance measures. Using MicroStrategy's Narrowcast Server, executives and senior management receive a daily report via email. "This was one of our biggest wins. It is the single source for executive briefings. If this report isn't in people's email inbox first thing in a morning, it's all hands on deck until we get it out," says Thorson.

MicroStrategy users include managers at headquarters in Nebraska as well as in the retail stores. A number of them use MicroStrategy Mobile, and Thorson sees this as a high growth area of the BI

solutions. “Users love it. We will see more and more of this as people learn about Mobile.” At the same time, Thorson wants to be sure that the company is thinking about what data is just “nice to have” versus being used to drive decisions. “Too much data that is only nice to have can turn into noise.”

The way in which the BI product has been rolled out is also part of the success. Cabela’s used a wave approach to their MicroStrategy implementation, first identifying a network of power users. These 50 power users were offered 2 days of formal training. The first wave of users generated excitement. In a second wave, 600 casual users were offered 1 hour training sessions. Only after these training sessions were people granted access to MicroStrategy. Today, the power users act as a first level of support for the many casual users. On a monthly basis, the power users meet to share best practices, tips, and questions and answers.

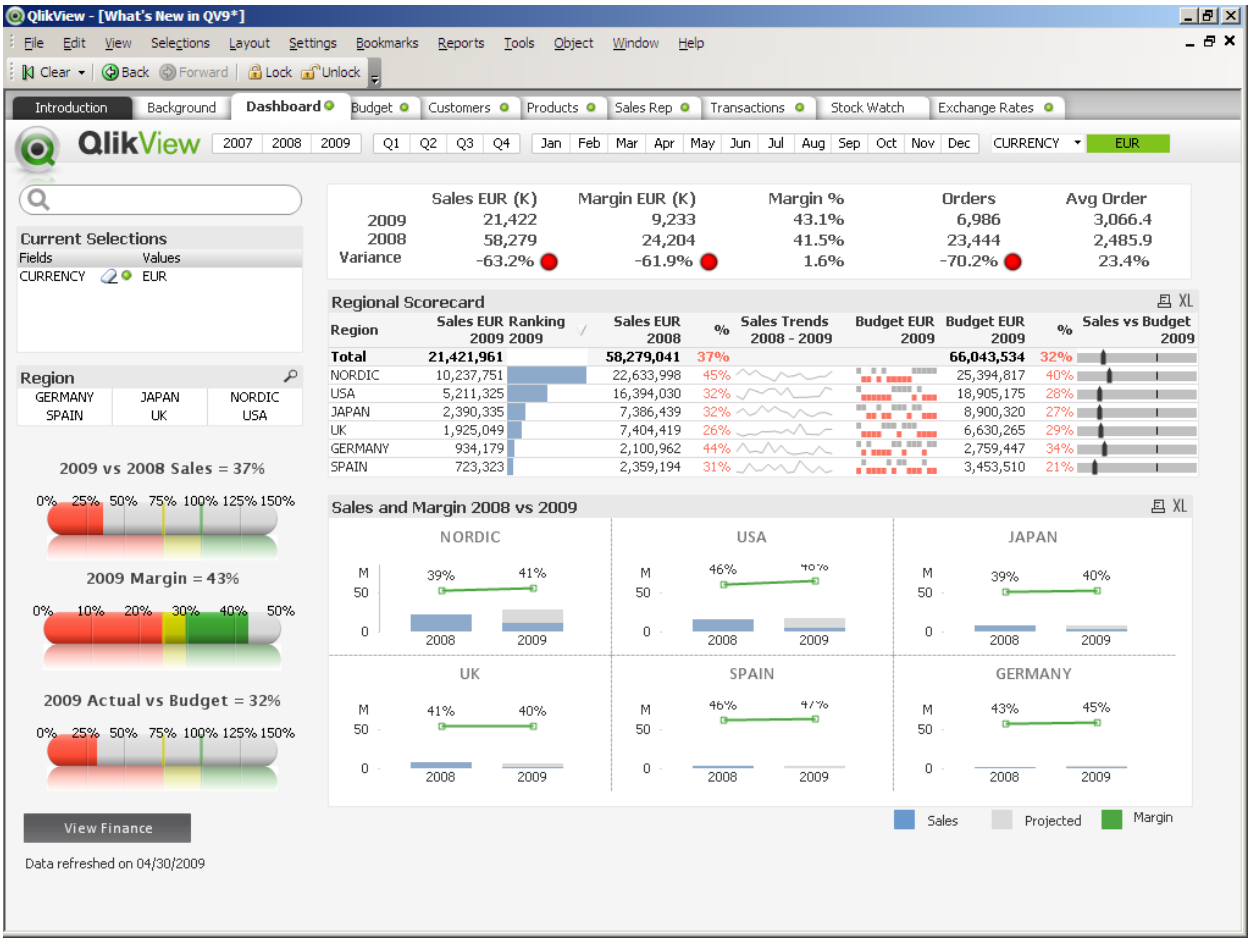
Because of both the ease in which MicroStrategy can be deployed and ease of use for business users, the EDW team can deliver new reporting applications faster. They’ve reduced support costs and reduced confusion for business users. While the effort started with merchandizing, MicroStrategy is now also used for vendor compliance, product line analysis, and numerous other applications. BI is pervasive at Cabela’s, with 99% of employees using MicroStrategy.

QlikTech: Product Overview

QlikTech (www.qlikview.com) is a privately held company, with annual revenues of $120 million in 2008.

QlikTech differentiates itself on its associative, in-memory technology that allows for rapid prototyping and deployment. A power user or IT administrator loads data into QlikView via ODBC from relational databases, spreadsheets, or XML data sources using QlikView Developer. Data is stored in a highly compressed format. QlikView will automatically detect relationships in the data, so developers are not confined to star schemas as in traditional relational BI tools or hierarchical structures as in traditional OLAP tools.

An application developer then builds interactive dashboards. As shown in the following figure, each dashboard can contain multiple tabs or sheets that provide a different view of the information. Within any given sheet, the developer can readily create calculations and aggregations.



These applications can be used stand-alone or published to QlikView Server. When deployed to QlikView Server, users can navigate the dashboards, drill, and filter via any browser, iPhone, Android or BlackBerry. Because all of the data is loaded into memory versus being retrieved via a SQL query from disk, response time is instantaneous. QlikView Server allows for centralized security.

QlikView Publisher provides scheduled refreshes of the models and email distribution capabilities.

QlikView runs on either 32-bit or 64-bit Windows operating systems.

Product Packaging and Pricing

QlikView Personal Edition is available for free as a single user version. Multi-user and Server versions are licensed on a named-user basis.

QlikTech Case Study: DAKOTACARE

Background

DAKOTACARE (www.dakotacare.com) was established in 1986 and provides coverage to more than 120,000 customers nationwide, with 86,000 in South Dakota. Its network includes 98% of the state's physicians, all its hospitals, and over 98% of its pharmacies. A physician-owned company, DAKOTACARE also provides disease management programs and wellness education to improve patient care. In addition to offering health insurance to insured customers, DAKOTACARE also acts as a third-party administrator (TPA) in 14 states, processing more than 2 million claims a year.

Business Challenges Faced

Like many insurance companies, DAKOTACARE has mountains of data, both in terms of the breadth of information but also details down to diagnosis codes for individual patients. By 2002, DAKOTACARE had amassed hundreds of millions of records on subscribers, providers, claims, and diagnostic codes, but they had no easy way to analyze the data.

At the time, the company had no business intelligence (BI) solution, and IT's role in BI was simply to write reports. Explains Mark Tracy, Director of Decision Support Systems, IT would develop reports to answer questions, distribute those reports, and that would lead to more questions and more reports. "By the time we had the information to make a decision, the time window to make that decision had already passed. If there was a time to value for those decisions, those opportunities were gone."

So in 2002, Tracy began looking for a solution that had a low price point, low cost of ownership, and was easy to use.

Ease of Use, Interface Appeal, and QlikView

One of the aspects of QlikTech QlikView that appealed to DAKOTACARE was the ability to create a proof of concept before purchasing the solution. From a developer point of view, the tool is easy to deploy because of the way that it associates data. Developers do not have to first build a cube with rigid structures.

QlikView is more than just easy for developers; it is also easy for business users. "It really is click and view. It's that easy to train folks to use the tool. We threw together a proof of concept (POC) and executive management was blown away. It was easy to sell them on the purchase."

QlikView also was an early adopter of 64-bit technology, and given DAKOTACARE's volume of data, this was a differentiator. With 64-bit technology and QlikView's in-memory architecture, more data can be loaded into memory than in traditional 32-bit operating systems and BI products. "We couldn't do without 64-bit, and we bought on the promise that QlikView was going 64-bit," recalls Tracy.

What started initially as a POC to provide better information on claims processing has now grown to 50 different applications that include wellness management, fraud detection, and risk analysis. In claims,

customer service representatives (CSR) use QlikView to track the number of claims submitted, processed, and the time to process, either by member or by insurance plan. If a member calls with a question about a payment delay, the CSR can look up details immediately instead of having to ask IT to build a new report as was done in the past. This allows DAKOTACARE to provide better service by immediately explaining why a particular claim was delayed. In terms of wellness management, the application allows DAKOTACARE to be more proactive with members and their physicians by monitoring the activities and prescriptions for various diseases.

One of the challenges with an easy-to-use tool is that more people may have access to data that is very complex. “Learning QlikView only takes an hour, but we spend days on training because of the complexity of the data.” There are different dashboard views tailored for different levels of users. Certain tabs within the dashboard will not appear for particular levels of expertise. Each application starts with a high-level dashboard that gives an executive an at-a-glance view. For example, with the speedometer visualization, it’s very clear when a needle is in red that there is a target that has not been met. Additional tabs within each dashboard allow different groups of users to access more detailed information. There are a minimum number of drop-down menus so the dashboard is easy to use.

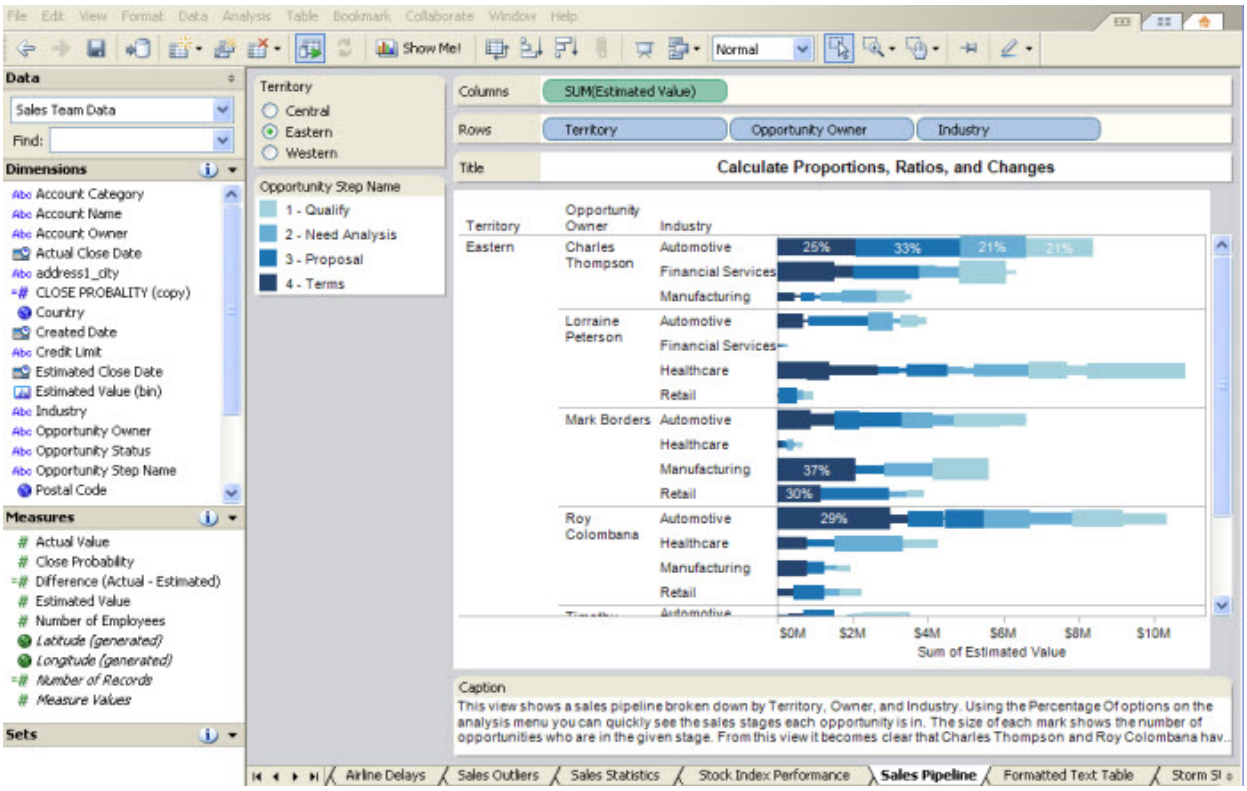
Patient confidentiality is a major concern in the healthcare industry, and DAKOTCARE is leveraging two features of QlikView to ensure confidentiality. The QlikView Publisher module allows DAKOTACARE to distribute subsets of data to the different insurers; each insurer sees information on only their members. QlikView also allows individual member ID numbers to be scrambled. The IDs are rescrambled each time the data is refreshed, so there is no way to track information down to the individual member.

QlikView has become a powerful tool in allowing DAKOTCARE to fulfill its mission of making healthcare affordable and efficient while providing exceptional service.

Tableau Software: Product Overview

Tableau Software (www.tableausoftware.com) is a visual discovery tool. The company was founded by a team of Stanford university students and is privately held.

As a visual discovery tool, the process of querying and visualizing data with Tableau is a single step process. The following figure shows how business users drag and drop measures and dimensions onto a worksheet. Tableau will automatically pick the best visual representation of the data, whether a tabular display, scatter plot, bar chart, or trend line for time series-based data. Tableau can either replicate data in a Tableau extract or can access live data in spreadsheets; Microsoft Access databases; relational data sources such as Microsoft SQL Server, DB2, and Teradata; or multidimensional databases such as Oracle Hyperion Essbase and Microsoft Analysis Services; as well as columnar databases such as Vertica.



As users see the data, quick filters enable them to readily filter the data via checkboxes and sliders; for example, there is a quick filter for Territory in the preceding figure.

In querying the data, users can change aggregations for measures, bin dimensions, or create new groups. Individual worksheets can then be presented into a dashboard. Using Tableau Server, dashboards and workbooks created in the desktop editions can be shared and accessed via a browser.

Pricing and Packaging

Tableau Software comes in three editions:

- Desktop Personal Edition for $999 that can access data in Excel, Microsoft Access or text files.
- Desktop Professional Edition for $1,800 that can access data in personal and enterprise databases.
- Tableau Server that allows Professional Edition users to publish workbooks to a server, so consumers can access and interact with data via a browser.

Tableau Software Case Study: Barnes-Jewish Hospital

Background

Barnes-Jewish Hospital (BJH) (www.barnesjewish.org) at Washington University is the largest hospital in Missouri. It serves over 50,000 in-patients a year and more than 80,000 emergency room visits. It has been consistently ranked by U.S. News & World Report on the honor roll of best hospitals in the country. Like many hospitals, ensuring the appropriate staffing levels when demand varies is an ongoing challenge.

Business Challenges and Requirements

In 2009, Barnes-Jewish Hospital was implementing a new time and attendance system. With the new system, the Patient Care Services had an opportunity and determination to stop labor budget overruns that had become the norm. The goal of the project was to optimize the staffing levels and reduce the variance in both overstaffing certain departments and understaffing others.

Dr. Linh Dye is a Project Manager within the special projects group, a group within IT that delivers targeted solutions. The return on investment for projects delivered from this group has to be both large and fast. With the implementation of the new time and attendance system looming, Dr. Dye's team knew that to improve the staffing levels, they would need to change processes and provide greater transparency for everyone involved. The solution had to be easy enough for potentially 9,000 employees to use. They had only 70 days to find a solution.

Ease of Use, the Interface, and Tableau

Barnes-Jewish Hospital had other BI tools in place at the time, but they were used primarily within enterprise applications in which IT develops reports.

Ease of use was the number-one criteria in evaluating a product. "Our business partners know their data better than we do. They use the data. I knew if the product was easy to use, it would free my team's time to focus on the more technical challenges versus creating reports," explains Dye. Dye was looking for a solution that her team of 3 could use to support potentially 9,000 people. The second key factor in selecting Tableau was the ability to visualize the data. "It's like painting the data. It's so vivid and beautiful. This generates interest."

Dye and her team downloaded the trial version of Tableau Software. The online training was easy - another factor that influenced their selection. "We got business users to try Tableau, using their own spreadsheets to create reports and dashboards." The tool is so easy to use that training for the 3,000 users is not required. It's only the power users who need the online training. While users may not need formal training, Dye advises that you still need a formal process to identify which reports are important and should be centrally shared. The special projects team and Tableau power users continue to meet on a weekly basis to review reports and prioritize.

Tableau allows users to access data in the hospital's many databases including SQL Server, DB2, Oracle, Microsoft Access, and spreadsheets. The daily labor productivity data lets people see details down to individual time card punches, lunch breaks, and premium paid usage such as cost of overtime. In the past, people may have run a standard report and exported data to a spreadsheet to analyze. Dye says that because the users, rather than IT, are now developing the reports, there is less exporting to spreadsheets to sort, filter, or chart the data. The business users can design the reports and dashboards the way they need the information, so there is less exporting.

The application is robust enough for BJH to analyze two years of staffing data, including scheduled hours, actual hours, and budget hours. Establishing baseline staffing levels has allowed the hospital to identify areas for improvement. These metrics can also be compared to other hospitals staffing levels.

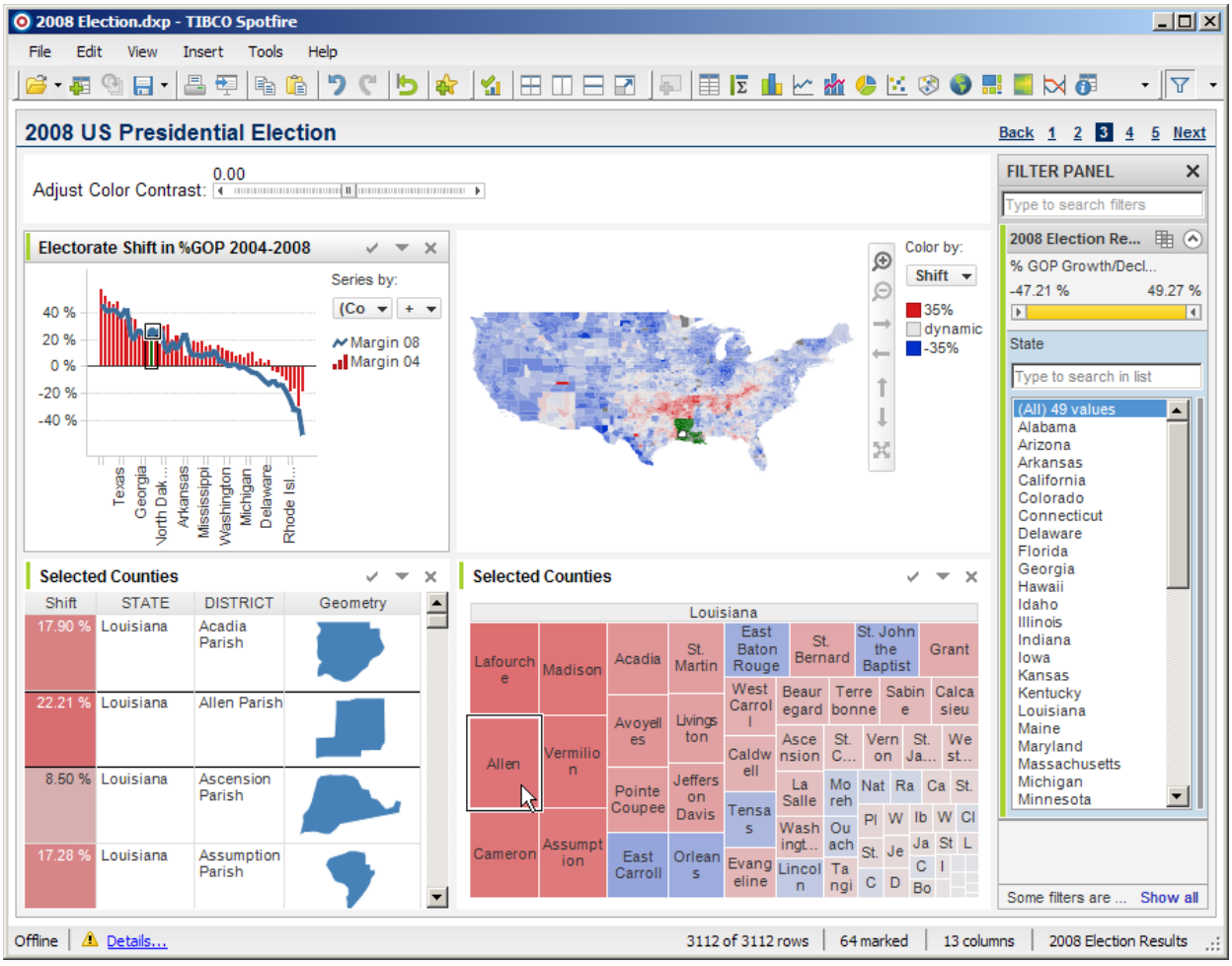
The solution has saved the hospital millions of dollars, and they have not gone over budget on staffing since it was implemented. Dye continues on the strategic vision for BI to reach all employees at the hospital. Tableau will soon be embedded in a new touch-screen application that will be accessible at all the nursing stations. Nurses will be able to see a full task list with information from many data sources and applications. "For three years, we have dreamed to transform nursing workflow and the workforce with information technology." Tableau Software is helping to bring that vision to a reality.

TIBCO Spotfire: Product Overview

Spotfire (http://spotfire.tibco.com) is a division within TIBCO Software that is dedicated to developing analytics and BI solutions. TIBCO Software is publicly traded on NASDAQ and had more than $621 million in revenues in 2009. TIBCO Spotfire competes as both a single-user analytics and visualization solution and as an enterprise-wide application development environment that includes advanced visualization and exploration, predictive analytics, and prebuilt analytic applications.

TIBCO Spotfire Analytics

There are several products in the TIBCO Spotfire Analytics product line, ranging from desktop based in-memory clients used for free-form ad hoc analysis and dashboard authoring to interactive web-based clients used for consuming prebuilt dashboards and applications. TIBCO Spotfire also provides a comprehensive statistics and data mining client for authoring models, statistical scripts and predictive analytics that can then be integrated into the user-facing desktop or web-based clients.



TIBCO Spotfire Professional is the desktop product that allows business, technical, and scientific users to access data in flat files, spreadsheets, and relational data sources. Spotfire uses in-memory

technology to cache the data, often from multiple data sources. Without scripting or knowledge of SQL, developers and business users themselves build dashboards and applications that are highly interactive. As shown in the figure, each application can contain multiple tabs with analytics and data visualizations. Spotfire supports a number of advanced visualizations including network maps, trellis charts or small multiples, and tree maps. Using Spotfire's API customers can also create customer visualizations. Interactive controls such as sliders and checkboxes, shown at the right, allow users to dynamically filter information at the speed of thought. This filter panel is built automatically by Spotfire as new data is loaded into the client.

For each data element, users can access additional details on demand by selecting any visualization, such as a bar in the chart or bubble on a map.

Developers can also create guided analytics by linking to particular tabs within the application or to other applications.

Spotfire applications can be published by users themselves to Spotfire Analytics Server and accessed via any browser with Spotfire Web Player without any additional programming steps. When accessed via Spotfire Web Player, even novice users have full access to the filter panel and details on demand.

Spotfire S+ is a statistical modeling environment based on the S+ (S-PLUS) statistics language that can be used for stand-alone data mining applications or integrated with user-facing desktop or web-based clients. Spotfire's Statistics Services product also enables Spotfire applications and dashboards to present calculations and predictions created with R, the popular programming language and software environment for statistical computing.

Spotfire runs on either 32-bit or 64-bit Windows operating systems.

Product Pricing and Packaging

Select TIBCO Spotfire products can be licensed on a monthly or annual basis for individual users from their web store. The entry-level Spotfire product, Spotfire Express, can be licensed for $79 per month. Pricing for enterprise deployments is not publicly available.

TIBCO Spotfire Case Study: Chevron

Background

Chevron is a leader in deep shore oil and gas exploration, with production facilities around the world. In 2008, it produced 2.53 million barrels of oil per day.

Business Challenges Faced

Drilling for oil is a high-priced gamble. Some wells may produce more oil than others, but the cost to drill may also be more expensive. Drilling in the frigid, deep North Sea may initially seem more expensive than the calm Gulf of Mexico, at least until a hurricane hits. So oil exploration companies drill in different places, constantly assessing the costs, the possible yields, and the risks.

Chevron was part of a consortium at the University of Maryland. The company joined the consortium to see what software innovations could help make a difference in operations. In the late 1990s, they caught a glimpse of the early stages of a product that would eventually become Spotfire. The founder of Spotfire, Christopher Ahlberg was visiting the University of Maryland and prototyped visualization and slider capabilities as part of a computer human interaction course.

When Mark Ruths, Senior Staff Geophysicist and Technology Coordinator, first saw Spotfire, he wasn't too sure how they would use it. Ruths only knew that different oil exploration sites had different cost factors. The goal in testing the application was to see if Spotfire could help Chevron better understand the cost of drilling operations and find ways to reduce costs. Chevron had a BI tool in place to run reports, but identifying patterns and opportunities for cost reduction was not easy.

Ease of Use, Interface Appeal, and Spotfire

What started as a trial with a handful of users in 2001 has now grown to 2,000 users and 500 different applications. "Ease of use is the number-one priority," says Ruths. "People have other applications they can use, and they have their current work processes. Change is hard, and if a tool is hard to learn, that's a big barrier. If it's easy to use, it keeps them working at it. It only takes a few 'ah ha' moments, and then they are hooked. They get value. The more you use Spotfire, the more value you get."

Getting over that initial hump is a challenge though, and the interface is the first impression. Spotfire lets users see their own data and can readily integrate data from different data sources. Integrating data from different data sources was difficult to do in other tools deployed at Chevron. Users would attempt to pull different data sets together manually in Excel. With Spotfire, users can easily combined data from multiple sources such as spreadsheets, Access databases, and the Oracle data warehouse.

Spotfire also lets users see and filter by multiple variables. The results are immediately plotted. "Those plots can be linked so you can visualize and get an ah ha moment. They can see patterns that they haven't seen before."

Chevron also uses Spotfire as a prototyping environment so that they can test the value of an application before fully developing it. For example, to boost oil production in certain wells, the company may choose to direct water to sweep oil to a main well. Geologists will model how much water to put into the injection well, but the reality is never quite the same as the model. Spotfire allows the geologists to compare the production data, analyze the overall pattern for a single well, and then adjust the water flow accordingly.

Originally, Chevron's operating partner on one particular well did not want to share data. However, once Chevron could show the operator how the data was used, the partner saw the value of it. "The partner was blown away. We could answer questions on the fly." The ability to use Spotfire live during meetings has also changed the value of meetings, because they can show the data, answer questions, and then immediately make decisions based on the data. Features such as filter bars and sliders make filtering data easy, and the graphs all change instantaneously. While Spotfire has a 64-bit version, Chevron is running the application on 32-bit PCs. The data sets they work with contain 100s of thousands of rows, with 100s of columns of variables, and the response time is still instantaneous.

"I can't believe it's really working for us, because it doesn't feel like work. It's fun, and people rarely say that about software. They are making discoveries they hadn't been able to make before, and that's exciting!"

About the Author

CINDI HOWSON is the founder of BI Scorecard, a resource for in-depth BI product reviews, based on exclusive hands-on testing. She has been advising clients on BI tool strategies and selections for 15 years and is the author of two books. Prior to founding BI Scorecard, Howson was a manager at Deloitte & Touche and a BI standards leader for a Fortune 500 company. She is a TDWI (The Data Warehousing Institute) faculty member. She has an MBA from Rice University.

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