COMPUTERWORLD
TECHNOLOGY BRIEFINGS
BUSINESS INTELLIGENCE

Intelligent Users Use Business Intelligence

From sports teams to traffic police to banks to hospitals, organizations are using analytical tools to turn data into knowledge.

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EXECUTIVE SUMMARY

Fine-Tuning Business Intelligence

Business Intelligence (BI) — the use of reporting and analytical tools to solve business problems through sophisticated data analysis — is still struggling to gain enterprise acceptance. All too often, BI is done only by isolated departments or managers, and the results are not put to good use throughout the organization.

But by extending the use of BI to more business functions and enhancing BI systems so they provide both analysis and recommendations, organizations will be able to get the most from their BI investments.

Analysis Boosts BI Payoff

For years, the primary examples of BI have been identifying trends such as which products are selling best in which markets or where in a production process prices are spiking. Now, leading-edge BI implementers are adding analytic capabilities to help solve problems or exploit opportunities as they are found.

Ford Motor Co. is a good example of the power of adding analysis to numbers. In 2002, it deployed a Web-based portal that allowed its 10,000 dealers to quickly identify warranty problems and see how their costs for warranty repairs compared with corporate guidelines. Now, Ford is also offering various diagnostic capabilities and how-to manuals that point to specific conditions that might be causing trouble.

In Competing on Analytics: The New Science of Winning, Harvard Business School Press, 2007) IT researcher Thomas Davenport and co-author Jeanne G. Harris say one of the most effective ways to add analytics to a BI application is to ensure that the analysis shows how non-financial factors affect financial performance. For example, Hilton Hotels Corp. has determined that every 5% increase in customer loyalty in one year generates a 1% increase in revenue the following year.

Swift Trade Inc., a securities trading firm in Toronto, give its 3,000 traders reports that provide details on how their trades affect the company's overall profit and loss. Sharif Zaman, the company's director of IT business development, gives BI partial credit for helping the company increase its sales 4,000% over four years without adding a significant number of new employees.

Davenport and Harris also cite BI-driven breakthroughs such as yield management — constantly shifting prices for airline seats as flight time nears so airlines make the most profit from them. What was once a competitive advantage for American Airlines Inc. has now become a "cost of entry" application used by all airlines.

To gain more enduring advantages, they suggest that companies 1) gather and analyze data which is unavailable to their competitors,

2) analyze widely-available data in unique ways, 3) embed analytics into distributed business process and/or 4) develop unique algorithms or tools to analyze data that's unavailable to the competition. See Analytics Can Help Your Company (and the Red Sox) for more from Davenport and Harris.

Leading BI implementers also don't rest on their laurels. Overstock.com Inc. has increased the frequency with which its managers get reports from weekly to daily to hourly and is on the brink of moving to providing updates every second. CEO Patrick Byrne credits BI with helping to cut inventory levels from $80 million to $16 million without affecting sales. BI has also helped the shipping department know which products incur extra shipping costs, allowing them to apply those charges to a specific shipment or change the packaging to get lower shipping rates.

Getting the most out of BI also means retraining users and revising important components of the BI system such as data definitions as business conditions change. Six years after implementing its BI system, the Jefferson Regional Medical Center in Pine Bluffs, Ark., constantly checks with managers to be sure its definitions for common terms such as patient still make sense given changes in medical and financial regulations.

Remember the Basics

Even the most advanced BI users, however, need to get the basics right.

The first basic is, of course, data integrity, without which any other business intelligence efforts are useless. Organizations need the proper technologies to cleanse inaccuracies, multiple entries and old information from the data which will analyzed by BI tools.

They must also impose standards for tools and processes, so users in different parts of the business use consistent data sets when tracking critical metrics such as sales, costs and profit margins.

BI implementers also must balance the benefit of letting more employees use BI tools so they can make better decisions against the risk that inexperienced users will run queries based on old or incomplete data, or that they'll slow down analytical systems with too many unimportant queries. Some firms are providing specialized training based on users' roles to help reduce the number of unnecessary queries they run.

IT and business managers implementing BI must also combine short- and long-term thinking so they can meet immediate needs while building an infrastructure for the future. At the District of Columbia's Court Services and Offender Supervision Agency, the BI staff met many users' requests with a small set of reports it could deliver to them quickly and cheaply. While meeting those short-term needs, the staff is also planning a BI infrastructure that can support future capabilities such as geographic information systems.

Finally, BI veterans suggest paying attention to when and how BI analysis is delivered to users. For less-expert users, an e-mail notification or canned report through a Web portal may be enough. More advanced users may want analysis delivered in the form of electronic spreadsheets, so they can analyze the data using their own custom formulae.

WHAT'S IN A NAME?

Howard Dresner coined the term business intelligence in 1989 while an analyst at research firm Gartner Inc. He left there in 2005 to join Hyperion Solutions Corp. as chief strategy officer. Recently, Dresner answered questions from IDG News Service reporter China Martens.

Does today's definition of BI differ from what you originally intended? It's probably been redefined a little. It's all about ways to deliver information to end users without needing them to be experts in operational research.

What has held up BI adoption? It's typically not technology that holds adoption back; it's business culture and organization. Technically, we've come a long way. Information objects are getting so much more sophisticated and intelligent.

How do industries stack up in terms of BI adoption? What's the geographic distribution of BI users? Finance is all over it; they've got no choice. For years, consumer packaged goods [companies] were one of the early innovators. Probably 35% of people using BI are in finance, then consumer packaged goods, retail, manufacturing and government, and then it trails off. Everyone understands it's important. There's some health care and education, but they both have limited [IT] budgets.

The Next Wave

At the cutting edge of BI, some vendors (and customers) are adding text analytics to business intelligence. Health care, insurance and finance are among the industries that could benefit by linking the analysis of structured BI databases to mining unstructured, text-based e-mail, document management, and even blogs and Web sites for information.

BlueCross BlueShield of Tennessee Inc. is using combined text and database analysis to more accurately predict the cost of insuring high-risk and low-risk patients in four disease categories. In Kentucky, a mathematics professor used a combination of text analysis and classic BI to prove that a new antibiotic was safe enough to prevent the amputation of her husband's leg. See "A Power Couple" (page 18) for more about these examples.

Many organizations have yet to tap the full potential of BI to develop products, reduce costs, exploit new markets and fine-tune their operations more effectively than their competitors.

IDC's BUSINESS ANALYTICS SOFTWARE TAXONOMY

- Performance management tools and applications
- Financial performance and strategy managment applications
- CRM analytic applications
- Supply chain and services operation analytic applications
- Workforce analytic applications
- Business intelligence tools
- Query, reporting, analysis
- Advanced analytics
- Analytic spatial information management tools
- Data warehouse platform

Source: IDC, 2007

Financial institutions, for example, might combine text analytics with BI to generate "watch lists" of potentially fraudulent transactions, and compile documentation for legal discovery processes that would have been impossible to gather through manual association of data sets.

Delivery giant United Parcel Service Inc., on the other hand, has found new efficiencies through its analysis of its data. It is now changing its ground delivery routes to reduce the number of left turns their trucks make in order to improve productivity and reduce gas consumption.

Reaching this next level of benefit from BI requires close attention to not only the ever-changing technology, but also the never-ending work of changing users' mindsets and attitudes. This executive briefing highlights the benefits of improving your use of BI, and provides tips on how to make those improvements. ◗

11 SIGNS THAT YOU'RE DOING BI RIGHT

How will you know you've arrived as an analytical powerhouse? Thomas H. Davenport and Jeanne G. Harris, the authors of Competing on Analytics, say the following 11 characteristics are signs that you've reached business intelligence nirvana.

Analysts have direct, nearly instantaneous access to data.

Information workers spend their time analyzing data and understanding its implications rather than collecting and formatting data.

Managers focus on improving processes and business performance, not culling data from laptops, reports and transaction systems.

Managers never argue over whose numbers are accurate.

Data is managed from an enterprise-wide perspective throughout its life cycle, from its initial creation to archiving or destruction.

A hypothesis can be quickly analyzed and tested without a lot of manual behind-the-scenes preparation beforehand.

Both the supply and demand sides of the business rely on forecasts that are aligned and have been developed using a consistent set of data.

High-volume, mission-critical decision-making processes are highly automated and integrated.

Data is routinely and automatically shared between the company and its customers and suppliers.

Reports and analyses seamlessly integrate and synthesize information from many sources.

Rather than having data warehouse or business intelligence initiatives, companies manage data as a strategic corporate resource in all business initiatives.

BI Goes to Bat

It's no secret that companies such as Capital One Financial Corp. and Harrah's Entertainment Inc. have for years successfully analyzed data about their customers to gain an edge over rivals. Now that competitive analytics and business intelligence techniques are more mainstream, corporations are jockeying for specialists who have solid analytical skills, says Thomas H. Davenport. He and Jeanne G. Harris teamed up to co-author Competing on Analytics: The New Science of Winning *(Harvard Business School Press, 2007). The two authors spoke with* Computerworld.

Computerworld: You mention the Boston Red Sox in the book. How are they using analytics to try to gain an edge over the New York Yankees?

Davenport: In professional sports in general, the key analytical capability is figuring out which players to acquire in the first place. The Red Sox aren't quite as rich as the Yankees, but they are richer than the Oakland A's, who have to be really good at evaluating undervalued players. The Red Sox have figured out [that] the Oakland A's can do the initial work and then [the Sox can] hire the players if the A's can't pay them enough.

The Red Sox also apply analytics to decide what to do on the field. In 2003, the Red Sox hired this guy Bill James, who is the god of baseball statisticians. The new owners were more analytically focused than previous ownership. James developed this idea of on-base percentage and slugging percentage as a method of success instead of batting average — and the Red Sox have applied this aggressively. The A's were the pioneers.

Not all [baseball] teams are that analytical. The [Chicago] White Sox aren't that analytical. The [St. Louis] Cardinals are somewhere in the middle. The [Atlanta] Braves are historically quite intuitive.

Harris: We're seeing this across professional sports. AC Milan [a professional soccer team] has a little bit different focus, getting players who are not injury-prone. There are 200 data points they look at. There's been a transformation occurring throughout professional sports. The New England Patriots have also applied analytics successfully.

Computerworld: So, are the Yankees using analytics?

Davenport: There's not much evidence that they have. They haven't hired any big statisticians. The players that they have do have good numbers in the traditional sense. A guy like [Alex Rodriguez] does, but that hasn't helped his team produce. They would be incredibly powerful if they had that, too.

Computerworld: How are some leading organizations using analytics to gain a competitive edge?

Davenport: FOne of the things that we say is that companies should be using analytics to support their distinctive capabilities. For Netflix, that distinctive capability is increasingly being able to predict what DVDs their customers will like. They have developed an audience preference algorithm called Cinematch, in which they try to predict whether a customer will enjoy a movie, based on how much they liked or disliked other movies. They're willing to pay $1 million to anyone who can improve the algorithm by 10% under a contest they're having.

Harris: UPS just announced that they're totally redoing their [ground delivery] routes to reduce their number of left turns their trucks make to improve productivity and reduce gas consumption.

Computerworld: Can a public-sector agency use analytics to "compete" against public-or private-sector "rivals"?
Davenport: New York was one of the earlier adopters, with the CompStat [comparative statistics] program, one of the reasons why Rudy Giuliani can say they reduced crime so much when he was mayor.
Harris: Very early in my career, I worked in the public sector, and we used analytics at the IRS for fraud detection. Some government agencies have some very sophisticated capabilities.

Computerworld: We often hear about the need for IT organizations to scrub their dirty data. How much of a problem is data integrity?
Harris: Data integrity is absolutely a huge issue if you don't have it. The integrity of data in the average corporation is getting better overall.

The reason some of these executive dashboards failed is that they tried to put a pretty face on some pretty bad data. But it's a contin-uing challenge for organizations. Data cleansing isn't very fun. But [leading] companies pay a lot of attention to ensuring they have the cleanest, most accurate data they can have.

Computerworld: Speaking of dashboards, some CIOs complain that CEOs and other executives have demanded that they get these tools to view and act upon daily or weekly operations data – but then either ignore the dashboards or use them lightly. What's the disconnect here?
Davenport: We make the distinction between reporting activities and analytical activities. Dashboards are purely reporting-oriented. There's no model that describes which nonfinancial factors drive financial performance and so forth.

One of the things we advocate to people who drive reporting are, What are the underlying analytical models that make those dashboards more meaningful? Hilton Hotels determined that for every 5% increase in customer loyalty this year, it generated a 1% increase in revenue the following year. Making the information meaningful can help generate more interest in these dashboards.

"You don't want people to be making decisions by the seat of their pants; you want [those decisions] to be based on facts."

JEANNE G. HARRIS
CO-AUTHOR, *COMPETING ON ANALYTICS: THE NEW SCIENCE OF WINNING*

Computerworld: You devote a chapter of the book to analytical people. What are some of the successful characteristics of CEOs who "get" this?
Davenport: In the really analytical companies, CEOs are really driving things. They need to be really passionate about this topic and do more testing and make decisions based on analytics and facts as opposed to intuition. If you're the head of marketing or human resources or supply chain, it's a question of asking, "Should my function be using analytics in a more aggressive way? What's the way that we could build some distinctive capabilities and gain competitive advantage using analytics?"

Computerworld: What are some improvements that CEOs can make to better leverage analytics?
Harris: COne of the things we found very consistently [among leading companies] is instilling a fact-based culture in your organization. You don't want people to be making decisions by the seat of their pants; you want [those decisions] to be based on facts. That's one thing an executive can do: foster a climate of fact-based decision-making.

Computerworld: What does the future of analytical competition hold?
Davenport: BWe tried to break that issue up into several different categories. There are the strategic drivers, human drivers and technological drivers. From the strategic side, more and more companies will start to view this as a critical capability that they'll need to have and what the long-term competition looks like with respect to analytics.

The airline industry pioneered analytics with things like yield management and crew scheduling, but they coasted on their reputations a bit and suffered.

Capital One is competing in a credit card market where lots of banks have adopted their approaches. So they have to constantly be thinking about how they can introduce analytics to [other] areas of banking, or other innovative approaches they can take.

The real issue is that there's going to be an analytical talent race.

There already is, to some extent. One software company told us it can take up to a year to find someone who understands the nature of their business and has strong analytical capabilities.

It will be interesting to see if more of this work goes offshore. There are lots of smart people in India and China, for example. But there are trust issues with having someone handling your data who's located thousands of miles away.

Harris: Analytics will also be used to differentiate products and offerings, such as Progressive Insurance offering customers the opportunity to evaluate competitors' quotes. There are golf clubs under development that can analyze your swing and provide you biometric feedback. ◗

THE OTHER SOX

Alec DeSimone, senior manager of internal audit at San Francisco-based Del Monte Foods Co., discussed his company's efforts to improve the security of its BI tools and spreadsheets in an interview with Computerworld.

What is driving the emphasis on BI security at Del Monte?

With SOX [Sarbanes-Oxley Act requirements], we're finding that we needed to take a more in-depth look at how we secure BI and spreadsheets.

We set up some preliminary practices in [early 2005] to secure the data, and to ensure that data – especially data that flowed through spreadsheets – was presented consistently. We set up a change management process. We put the spreadsheets on servers that had limited access.

Do you have policies in place now that limit the downloading of spreadsheets?

We limit people's access to the BI system. We have security over that data. Our feeling is that if they have been granted a certain type of access to the data . . that is our security over what they can download and what they can't.

What are your plans for future BI security projects?

We have a pretty robust BI security plan in place. We now are trying to standardize our access and security procedures across all platforms. We have several different access processes for various transactional systems and for separate BI tools.

We have a project in place to start standardizing our process for granting, changing and deleting access to all our platforms and applications. That was driven out of SOX. The more individual processes you have in place, the more expensive it is to comply with SOX.

OPINION

BI Is The Business

BY MARK HALL

Patrick Byrne has biked across the U.S. four times. On a recent journey, he pedaled a recumbent bicycle. It's better than a road bike, he says, because "unlike a road bike, where your head is down and you're looking eight feet in front of you, you're sitting up on a recumbent, and you can see everything."

New technologies generally known as wide area file services (WAFS) and WAN optimization have become available in recent years to address the performance problem while enabling remote office consolidation and protection. Enterprise Strategy Group (ESG) research indicates that early adopters of these next-generation optimization tools are realizing significant benefits.

Concerns and Challenges

Byrne, CEO of Overstock.com Inc., a Salt Lake City-based online discount retailer of brand-name goods, is equally enthusiastic about his business intelligence system, which gives him a broad, up-to-the-minute vista of his operations.

He claims that BI lets him view his entire business at a glance so he can make both long-range strategic and immediate tactical decisions that are grounded in solid data.

Savvy CIOs know that their bosses thrive on immediate, data-driven insights into the company's condition, which is why BI projects always rank high on our readers' lists of priorities.

In 2006, IT leaders placed BI third on Computerworld's list of things to do, and in our January 2007 Forecast issue, data warehouses ranked in the top four of "big-bang projects" for CIOs — even those with tight budgets.

Byrne says the data warehouse and analytic software from Teradata, a division of NCR Corp., has transformed his business from one where managers received reports week to week to one where "we push intelligence out to the front lines day to day, hour to hour." He also brags that the company is "on the brink of a system that can get intelligence out second to second."

VITAL STATISTICS

Launched: October 1999

Business: Online "closeout" retailer

Number of products: over 500,000

Chairman and CEO: Patrick Byrne

Employees ('06): 778 full-time

Ticker symbol: OSTK

Gross revenue ('06): $788.15 M

Source: Overstock.com Inc.

But Overstock.com isn't overloading its workers with esoteric information, Byrne argues. The information has pragmatic, bottom-line implications.

For example, he credits the Teradata software with helping to reduce inventory levels to $16 million from $80 million without affecting sales, giving a huge boost to cash flow.

It has also improved business processes because the information is granular and better understood. Without it, Byrne says, "costs get spread around like peanut butter and evenly allocated" — and that's bad business.

For example, before Overstock.com's BI tools were in place, United Parcel Service Inc.'s oversize-package charges were equally distributed across all shipments. Now, the shipping department knows exactly which products will incur those extra costs and can either apply them to a specific shipment or adjust the packaging to achieve lower mailing rates. With BI, Byrne says, the company "is flushing all those extra costs out of the system."

The success of BI has also changed the way Overstock.com views new hires. "People need to be able to work with data," he says.

Numbers drive the company now. As Byrne puts it, "the math team" that works with the Teradata analytic software "is our frontal cortex."

SOURCE: Gartner Inc., 2007

But maybe the most important change is the way BI has helped raise the company's value in customers' eyes.

According to the most recent annual National Retail Federation/American Express Customer Service Survey, Overstock.com was ranked No. 4 in a poll of 8,000 consumers who were asked, "Which retailer delivers the best customer service?"

Byrne attributes that stellar satisfaction rating to the BI applications and how "they transformed our business processes."

He says he pities any retailer that's not knee-deep in business intelligence. "If they don't use it, they're in the buggy-whip business," Byrne cracks.

In fact, when asked whether he considers Overstock.com a retail operation or a tech company, Byrne replies, "Neither. We're a BI company." ◗

Mark Hall is a Computerworld *editor at large.*

INTELLIGENCE RETURNS

A Plethora of Tools

Providing business intelligence tools to a wider swath of users can boost a company's bottom line, but widely expanding use of such products can also create problems for IT shops.

According to some IT executives, users often try to access far more data than they need just because they can once BI tools are installed. Some IT managers also point out that users often resist corporate shifts from one BI tool to another.

For example, Stave Watson, assistant director of the finance office of the Maryland Department of Transportation, says that the first time his organization put BI applications into place, the tools provided inexperienced users with too much access to information, and the users started running unnecessary queries.

"We had people running reports and doing queries who were causing a lot of performance problems," he says. The department solved the problem of "people always wanting access to all the data" by implementing customized training programs based on users' roles, he notes.

Steve Simon, senior technology officer at State Street Corp., an investment management firm based in Boston, agrees that letting BI tools provide users with access to reams of data is "an accident waiting to happen."

Simon notes that his IT shop works with users who complain when a report is taking five minutes to run. He says that he explains to them that such reports would be far more timely if requests for data were limited simply to information needed to make specific decisions.

The Indiana Public Employees Retirement Fund, which manages $17 billion in pension funds for retired workers, received pushback from users when it moved to replace the existing BI tool with a new one says David Huffman, CIO of the PERF. "I had to go against the whole state of Indiana when I switched," he adds.

Despite the initial resistance, he says, the PERF is now using the new

WORLDWIDE BUSINESS ANALYTICS SERVICES REVENUE (IN MILLIONS)

	Data warehouse platform services	Performance management applications and tools services
2006	$10,314	$18,712
2007	$11,248	$20,710
2008	$12,255	$22,935
2009	$13,339	$25,292
2010	$14,478	$27,929
2011	$15,828	$30,709

SOURCE: IDC, March 2007

tool successfully. For example, since installing the software, the time it takes to begin issuing checks to eligible workers has been cut from up to 180 days to 30 days from the date of retirement.

The PERF decided to make the change because the old tool required IT to write a new program from scratch every time a user wanted a new report, Huffman says. Also, the older tool was hard to use, he notes.

To ease the replacement process, Huffman says the IT operation asked users to test various reporting tools and pick a favorite. They chose the new application because of its ease of use, he says.

Ford Motor Co., on the other hand, has expanded its use of BI tools this year without major problems, says Jim Lollar, Ford's systems manager for global warranty operations. The automaker initially used the tool to build a portal that provides its 10,000 dealerships with dashboards that show whether their costs for warranty repairs are in line with corporate parameters, he says.

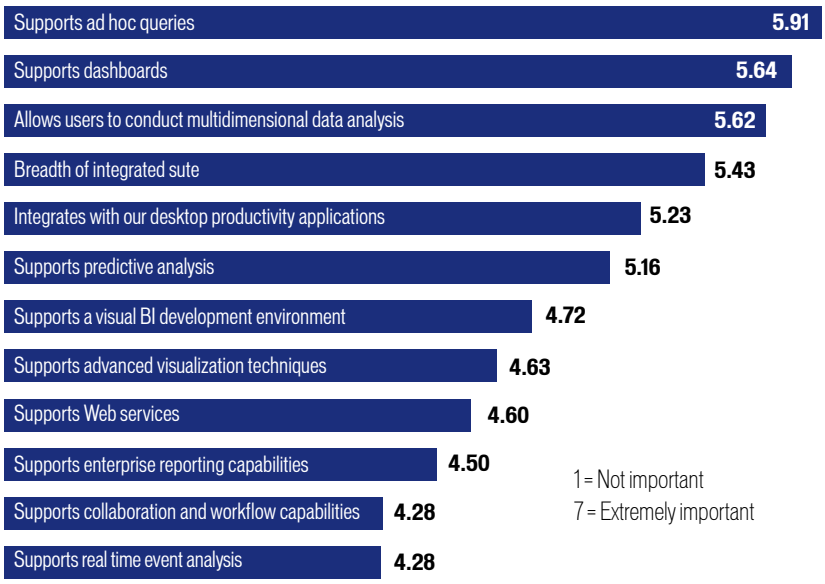
"The real value is we get these dealers back near their peer group's average [for repair costs]," Lollar says. "That is when they really save Ford money."

This year, Ford added an application that collects data about repair performance for auditors, who use the information to work with dealerships whose repair costs go beyond the parameters, Lollar says. This application has allowed Ford to bolster the efficiency of its audits, Lollar adds.

Swift Trade Inc., a securities trading firm in Toronto, has used BI to provide its 3,000 traders with reports that provide details on how their trades affect the company's overall profit and loss, says Sharief Zaman, Swift Trade's director of IT business development.

The company also uses business process management tools to automatically trigger business processes based on certain event, he adds. He attributed the company's ability to increase its sales 4,000% over four years without adding a significant number of new employees in part to the use of the BI tools. ◗

BI PLATFORM CAPABILITY IMPORTANCE RATINGS, 2007



Base: Approximately 300 attendees at the North American and the European Gartner Business Intelligence Summits, 2007

SOURCE: Gartner Inc., August 2007

CASE STUDY

Better BI boosts TCO

Pitney Bowes
Engineering the flow of communication™

PITNEY BOWES INC.

Stamford, CT
www.pb.com

Industry: High Technology
Revenue: $5.5 billion
Employees: 35,000

Oracle Products & Services

- Oracle Business Intelligence Suite Enterprise Edition
- Siebel Sales Analytics
- Siebel Marketing Analytics
- Siebel Service Analytics
- Siebel CRM
- Oracle Database
- Oracle Real Application Clusters

Key Benefits:

- Reduced total cost of ownership
- Enhanced sales productivity through better customer insight
- Increased responsiveness of sales associates, leading to greater customer satisfaction
- Improved marketing effectiveness with better segmentation and targeting

Pitney Bowes Inc. is the world's largest producer of postage meters, laying claim to some 2 million customers worldwide, 1.6 million of them in North America.

The company also makes other mailing equipment and provides shipping and weighing systems, as well as online postage services, financing for office equipment purchases, and facilities management services. Pitney Bowes also develops software to create mailers and manage shipping, transportation, and logistics for government agencies and corporations.

To manage its massive customer base, Pitney Bowes operates four call centers and employs 1,250 sales associates and 1,500 field service representatives in North America alone. Despite this huge commitment of resources, the company lacked a unified, coordinated approach to its vast customer service, marketing, and sales operations.

To remedy the situation, Pitney Bowes turned to Oracle for a comprehensive business intelligence solution that not only brought cohesiveness and greater analytical capabilities to its sales and marketing operations, but also would work in the context of Pitney Bowes' multifaceted IT infrastructure.

"Our technology requirement spans more than 10 legacy systems deployed on different technologies," said William Duffy, data warehouse project manager at Pitney Bowes Inc. "Oracle Business Intelligence Enterprise Edition was one of the few business intelligence tools capable of meeting the challenge."

The Case for Change

Over the past few years, Pitney Bowes has been on a nonstop growth trajectory, fueled by a string of acquisitions and a worldwide push to expand its service operations. Managing its customers has always been a top priority for Pitney Bowes. To assure that all customers—new or old—receive fast, appropriate services and offerings, the company launched a program called "The Power of One" in 2002. The program sought to provide customers with a consistent experience across all business units.

"We needed a business intelligence solution that would provide all customer-facing associates with the same customer information in real time so they understand who the customer is— regardless of the customer's location, history, and time with Pitney Bowes," Duffy said. "We also wanted to be able to analyze productivity and performance, which is key to helping us deliver the best possible service."

Dashboards and Analytics

Pitney Bowes implemented Oracle's Siebel applications for sales, service, and marketing analytics to manage its call centers, field service organization, and sales force. Oracle Business Intelligence Suite Enterprise Edition marries the information together to provide key information to the management of the company.

"Oracle's business intelligence solution gives us a 360-degree view of our customers and an infrastructure to keep on growing," Duffy said.

As the company hoped, the informa-

tion has translated to better service. "By providing analytics to all customer-facing associates, we provide a consistent and positive experience to Pitney Bowes customers," he said.

Building on Oracle

The new Pitney Bowes business intelligence component was part of a series of technological advances the company has undertaken in the past few years.

In 2002, Pitney Bowes embarked on a vision to scrap a decades- old legacy system that was interfering with its ability to develop new business opportunities, started replacing it with Oracle's Siebel CRM. The solution called for deploying a nationwide wireless field technology that improved the speed, consistency, and predictability of response time to service requests, increased the rate of first call resolutions, and enhanced customer

In considering its business intelligence solution, Pitney Bowes wanted continuity and compatibility with the CRM solution and its larger IT infrastructure, which is made up of several Oracle databases for its data warehouse environment.

"Oracle is our primary database platform, with well over 600 different production databases installed. We are running Oracle Real Application Clusters in some of our high availability environments," Duffy said. Ultimately, Oracle's business intelligence solution was the simplest and most sensible way to integrate and maximize the company's legacy systems and applications while adding new analytic and marketing capabilities to the mix

"It was a good way to bring all the information together to provide key information to management," Duffy said.

As presently configured, the "basic hardware topology" for the Oracle BI solution, Duffy explained, includes a database server, Web server, and two Unix servers on IBM platforms—each with eight CPU servers and various Windows clients.

> "With Oracle's business intelligence solution, we were able to deliver more than 400 reports to a large organization with just one person–now that's cost effective."
>
> **WILLIAM DUFFY, DATA WAREHOUSE PROJECT MANAGER, PITNEY BOWES INC.**

Assessing Performance

Pitney Bowes receives approximately 30,000 calls a day from its customers.

"On any given day, each of those customers has the potential to speak to a salesperson, need a repair on a piece of equipment, or need to talk to someone about a bill," Duffy said. "Managing all that information is a huge challenge."

Pitney Bowes needed to enable its sales representatives to associate each customer inquiry with a type of account—large or small—to make sure they were providing the appropriate level of service. The Oracle solution allows each representative to immediately access all information on each customer.

With Oracle's Siebel Service Analytics, Pitney Bowes can measure the performance of its call centers and effectively mange productivity of its 1,250 agents, ensuring responsiveness and improving customer satisfaction.

"Oracle business intelligence provides laser-like visibility into the of every sales rep," Duffy said. "We can better understand how agents are spending their time and what's not working. Oracle's business intelligence is key to our success in managing key performance indicators in call center productivity, field service organization, and effective campaigns."

Refining Campaigns

On the marketing side, Duffy noted, "Our biggest challenge was creating campaigns and using the data effectively to understand the buying and service behaviors of the customer."

Oracle's Siebel Marketing Analytics has helped drive important customer retention campaigns, including targeting customers with expiring leases. It further helps Pitney Bowes segment customers and understand the potential of new customers.

"Analytic dashboards drive every important customer retention campaign, including identifying and targeting customers with expiring leases," Duffy said. "By enabling marketing to segment customers, we can ensure that we call the right customers at the right time so we can retain those customers and generate new business."

Improvement in the Field

Pitney Bowes is using Oracle in its field service organization to track outstanding customer cases day-by-day. "For example, if a customer has an issue with a meter, inserter, or sorter, they can call into one our call centers and the agent will open a ticket in the CRM applica-

tion," Duffy said.

Each day, that information is fed into the Oracle applications, which provides dashboards and metrics so districts know where to dispatch their agents and how the field service technicians are performing in regards to response time.

"We very carefully track how long a call has been open to make sure the customer is assigned the right priority and receives service as quickly as possible," Duffy said. "Our goal is same-day service. Our business intelligence is helping us get there."

Why Oracle?

Pitney Bowes chose Oracle's business intelligence solution for three primary reasons. It is a long-time Oracle customer; it considers Oracle's business intelligence solution to be the most capable and comprehensive platform on the market; and because it wanted to take advantage of the pre-built business intelligence applications.

In addition, because the solution has what is known as "hot- pluggable" architecture that allows its components to integrate easily with third-party solutions, Pitney Bowes was able to integrate its business intelligence into its business processes, get insight from its legacy system, and analyze information from historical and real time data sources, Duffy said.

Ultimately, however, what sold Pitney Bowes on Oracle was the possibility of lowering ownership costs even as it gained new functionalities.

"One of the most important values of Oracle's business intelligence solution is its TCO," Duffy said. "The productivity we can achieve is astounding. We created 400 reports used by 1,250 users with a staff of one within a few months—that is very cost effective."

Implementation Process

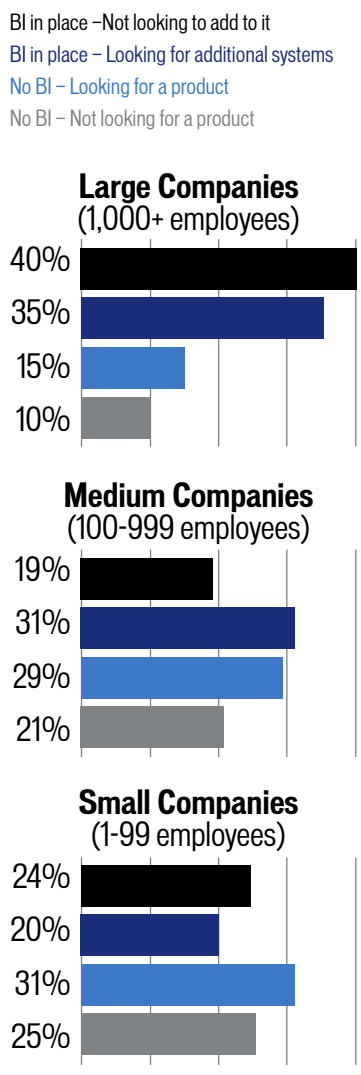
The key factors to Pitney Bowes' success in implementing a comprehensive business intelligence solution include gathering feedback directly from the business users, delivering the information that the business users were asking, availability of the right information to the right people at the right time, and ease of use of the business intelligence tools. Pitney Bowes created over 400 reports by a staff of one in a matter of a few months—a very rapid and cost effective business intelligence deployment.

Pitney Bowes Inc. provides the world's most comprehensive suite of mail stream software, hardware, services, and solutions to help companies manage their flow of mail, documents, and packages and improve communications.

BY THE NUMBERS

BI Is a Strategic Asset

CORPORATE BI USE



SOURCE: Computerworld Business Analytics/Business Intelligence Survey 2006

Business intelligence (BI) technology is evolving from a tactical tool to a strategic asset as many companies look to it to help bolster enterprise operations, but making that shift requires user buy-in and an ability to offer BI capabilities to growing numbers of workers, according to some IT managers.

Jim Young, director of the information services group at Allstate Insurance Co. in Northbrook, Ill., says his company is looking to expand its use of BI. The Northbrook, Ill.-based insurance giant's data warehouse contains crucial claims information that assists it in providing faster relief to the victims of devastating hurricanes and other natural disasters.

Allstate has collected reams of data gathered by adjusters crawling through a hurricane's aftermath. The data is updated daily and accessed by business analysts and managers. With the swift output of this BI data, Allstate managers can flag and process emergency claims much more quickly.

But implementation of the system had its ups and downs. Allstate faced a pair of challenges: user acceptance and the constant struggle to safeguard data quality.

Selling the system internally required Allstate's IT staff to tread lightly, explains Young. "We were able to balance the new system with traditional sources and explain the nuances that ultimately led to acceptance and adoption of the new solution by the claims area," he says.

Allstate plans to use the technology more broadly. "BI has helped demonstrate the success of close collaboration between IT and business units," says Young. "This project has laid a strong foundation for exploration into future BI solutions and will prove merely to be the beginning."

Now, Allstate is working to incorporate BI data into the business processes of employees who communicate with customers through telephone or online call centers or in person, Young says. About 33,000 Allstate workers already use BI tools to detect and analyze fraud, determine prices, process claims and manage the insurer's adjuster workforce, he says.

"We've got the data, [and] we need to mine that data and get it into the hands of people who can make some good decisions about how to cross-sell our products," he says. "Historically, we have done a great job of implementing BI somewhat tactically. Now, the opportunity is to start to bring together data from all the disparate parts of the company."

Allstate gained user buy-in for its new BI plan after putting together a "road show" to let key IT and business users know how it would work.

"We needed to make sure there weren't other initiatives going on in the company that would be derailed by our project," Young says. "We started to bring in key contacts from different development groups and negotiate timelines."

Douglas Chambers, administrator of the Office of IT Applications in the Georgia Department of Transportation

in Atlanta, says 200 workers and managers at the agency are currently using dashboards to monitor ongoing projects. During the first part of 2007, the department will roll out the dashboards to an additional 2,500 users, he adds.

"The dashboards allow upper management to drill down and see if a project is in trouble," Chambers says. "They can see exactly what is holding that project up. [The BI tools] have made the folks at the DOT much more aware of how . . they directly affect those projects being delivered."

Jonathan Rothman, director of data management at Emergency Medical Associates in Livingston, N.J., says the group practice of 250 emergency room physicians invested in BI tools after the Sept. 11, 2001, terrorist attacks.

The company uses the tools to identify potential disease outbreaks based on the symptoms of patients who come into hospital emergency rooms where members of the group practice. "Without BI, we couldn't have done it," Rothman says.

"The dashboards allow upper management to drill down and see if a project is in trouble."

DOUGLAS CHAMBERS, ADMINISTRATOR, OFFICE OF IT APPLICATIONS, GEORGIA DEPARTMENT OF TRANSPORTATION

Nicholas Berg, senior manager of global business intelligence at Seagate Technology LLC in Scotts Valley, Calif., says his company now has three separate global production versions of Business Objects software in place — including a system used at Maxtor Corp. prior to its acquisition by Seagate in May.

The company plans to replace the separate versions and run the new Release 2 of Business Objects XI throughout the company sometime next year, he says.

Berg did suggest that Business Objects add guided analysis tools in a future version of the BI tool set. Such tools suggest solutions for problems that the BI software discovers — an important feature for companies such as Seagate, whose user base includes power users and novices.

"We need tools [for] that user who doesn't know what the next step is . . to be able to guide them through to some recommended actions," Berg says.

BEST PRACTICES

Plan to Improve Planning

IT officials at some retailers say BI systems remain too expensive and too hard to implement for their operations. Others maintain that the benefits would likely outweigh the costs as retail companies could improve financial and supply chain planning, and thus increase profits, by using business intelligence systems.

Specialty apparel retailer Tween Brands Inc. is in the process of replacing an analytics system that used spreadsheets and mainframe applications with an integrated system made up of products from multiple vendors, according to Roy Deegan, vice president of IT solutions delivery and process engineering at the New Albany, Ohio-based retailer.

The new analytics system includes an Oracle 10g database, application server and portal; Oracle Retail Price Management software; and merchandising intelligence applications from SAS Institute Inc., all running on IBM p595 Unix servers, he said.

The project began in 2004 when the retailer launched a plan to upgrade its BI capabilities as part of an effort to boost efficiency, cut costs and create a better buying experience for customers, Deegan explains. The plan called for Tween to improve inventory planning and create "one version of the truth" for the company's financial and inventory analysts.

"When it came to the technology, we started with a clean sheet of paper," said Deegan.

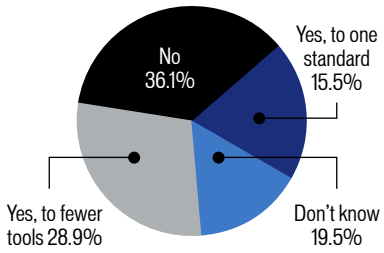
The Oracle Retail Price application went live last August. The company began rolling out the SAS software last spring, and that project is ongoing, he says.

Deegan says it's too early to project a specific return on investment, but Tween does expect that the rollout will lead to improved profit margins.

Kevin Stack, vice president and CIO at Jo-Ann Stores Inc., a retailer of crafting, decorating and sewing

CONSOLIDATE

Is your company planning to consolidate on fewer business intelligence tools over the next 12 months?

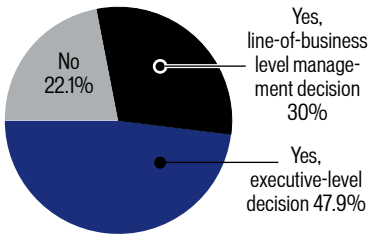


Base: 380 respondents involved in the acquisition of business intelligence solutions for their companies

SOURCE: IDC and InfoWorld, March 2007

PRIORITIZE

Has there been a management-level decision to make business intelligence a priority in your organization?



Base: 380 respondents involved in the acquisition of business intelligence solutions for their companies

SOURCE: IDC and InfoWorld, March 2007

products, says his firm is holding off implementing a BI system because of the high costs and the need for extensive manpower to implement it.

The Hudson, Ohio-based company is interested in evaluating new decision-support software from SAP AG,the supplier of its ERP software How-ever, any implementation of the software is at least three years away, he says.

"Before we can do it and provide business value, we must make sure that the business will have [the analytical methods] infused into their processes," Stack says. "The people in the business need to understand what to do with the data and how the data impacts other parts of the organization."

Keen Footwear, a Portland, Ore.-based footwear designer and distributor, plans to roll out ERP software and a BI application and dashboard from Lawson Software Inc.

The $1 million project will help Keen better share data and collaborate with retailers that sell its products to ensure that their stores have the right mix of footwear, says Joe Zitomer, Keen's director of operations.

The company has been growing rapidly, and its legacy system and processes couldn't handle new, more sophisticated planning requirements, he says.

The old system was a heavily customized application from LogOn Business Systems, a New York-based maker of apparel software. Managing inventory, Zitomer says, was becoming "guesswork." ◗

Potholes to Bypass

ESSENTIAL GUIDANCE

- Organizations should expand their view of BI beyond traditional query and reporting tools to include advanced analytics, search and discovery, business process automation, collaboration, and workflow management.
- It's frequently impossible, and usually not advisable, to try to gather all potential user requirements at the inception of a BI project. It is much more important to develop quickly, expose new functionality, and modify based on feedback on a continuous basis.

Business intelligence might be a maturing technology, but it's far from hassle-free. Tedious technology issues, including the need for comprehensive data cleansing and integrating incompatible computer systems, are still a big part of nearly all BI projects.

But it's the planning, return-on-investment (ROI) and people issues that users continue to count among their biggest BI problem areas. Here, five IT executives map out their strategies for navigating around user resistance and resentment, creating quick ROI wins and managing over-enthusiastic vendors.

1. Wrong Expectations

One of the earliest and easiest-to-hit potholes on the road to BI success is what Danny Siegel describes as the "radical variance" between BI software applications that are "functionally rich and very pretty," and the reality of what can be accomplished with the data a company has to work with.

"People dig themselves a hole by demonstrating next-gen capabilities to a user community that doesn't even have the data to get into standard reporting," says Siegel, director of data warehousing and business intelligence at New York-based Pfizer Inc.

Part of the problem lies in how vendors make their case to IT executives during the software selection process. "Those presentations tend to be highly structured with as much visual appeal as possible, because they're trying to sell business users," Siegel says.

"But the reality is that the true requirements are not around what's visually appealing. They're around getting complex reports turned into something that's navigable," he adds. "It's block-and-tackle reporting that's needed."

Allowing a vendor to show end users a BI system that's replete with color charts, graphs and tables is a near guarantee of user dissatisfaction with the system that ultimately gets implemented. One way around that pothole, Siegel says, is to insist that vendors work with actual company data during all software demos.

"I give the vendor live data with all of its vagaries, inaccuracies and dirt," he says. "Sure, we want a system to be visually appealing, but we also want it to be meaningful. Piloting with your vendors is important because you're showing your users what can [actually] be achieved."

2. Wrong Hands

Front-line managers, rather than executives, are most often responsible for worker productivity and daily sales. BI tools can help boost both. But too often, companies first give BI tools to executives, who then push down policy changes, observes Robert Fort, CIO at Virgin Entertainment Group Inc. in Los Angeles.

Virgin, which operates 13 megastores at prime locations such as Hollywood Boulevard and Times Square, first started its BI project in its stores. "You can't manage what you don't measure," Fort says, which is why the company provides its

store managers with the most accurate and up-to-date sales information available. Store managers access the BI system, known as Crescendo, via a Web-based portal.

Traffic and sales information is pulled in every 15 minutes, Fort says. His group has developed software-based report templates so store managers can point and click their way through Crescendo to learn things like a store's browser-to-buyer conversion rate, its average hourly sales rate and how those rates compare to other stores' rates or even their own year-ago figures.

"We went back 18 weeks later and measured sales lift," Fort says, adding that 20% of the stores' overall sales increase during that period was directly attributable to the BI system.

"We definitely have changed the culture in stores," Fort says. "They're held more accountable, and they operate more in real time. They can see trends in the middle of the day and correct them."

The bottom line, he says, is this: "If you put tools in the hands of people who clearly want to be making a difference and make them user-friendly, they'll run with it."

3. Wrong Data

Successful BI is all about providing users with actionable information, not just data, says Jim Lollar, Ford Motor Co.'s systems manager for global warranty operations.

When the automaker launched its Web-based warranty portal five years ago, the goal was to give Ford's 10,000 dealers worldwide the ability to quickly identify their warranty problems and see how their costs for warranty repairs measured up against corporate parameters. Previously, they had received the information in a paper report known as the "126 Report."

> "[We're] all looking at the same picture, but everyone sees different things."
>
> **MORIE MEHYOU, ASSISTANT VICE PRESIDENT, INFORMATION MANAGEMENT AND DECISION SUPPORT, JEFFERSON REGIONAL MEDICAL CENTER**

This tabular report showed how a dealer's performance numbers compared with those of other dealers in their geographic regions. Next, the automaker added six months of rolling data and applied statistical process controls to identify abnormal performance. "Dealers could pull it down on demand from the Web," Lollar explains.

The upshot: Dealers could see where they had problems and compare their performance against their peers'. Problem was, that didn't really help them fix problems or improve performance.

Now, Lollar's group also provides dealers with various diagnostic capabilities that point to specific conditions that might be contributing to performance problems.

"Before, we never tried to help dealers with how to fix the problem. The report would have a variance number with a condition code beside it, and that's all we gave them," says Lollar. "The message was 'Here — you have a problem; figure it out.' Now, we deliver diagnostic capabilities and how-to manuals. The system also lets dealers drill down to [more detailed] sections about repairs and costs."

Lollar says the system has been an overwhelming success. Information is now delivered in 15 languages to dealers worldwide. "And only a very, very small percentage of dealers get to an audit for performance reasons," he says.

4. Wrong Training

Jefferson Regional Medical Center in Pine Bluff, Ark., provides its administrative and clinical staffers with a self-service, Web-based portal for quickly finding specific information on patients, insurance reimbursements, staff productivity, admission trends and more. Virtually all operational data from every department — from materials management to pharmaceuticals — is accessible via the portal. That's the good news.

The challenge is that "we're all looking at the same picture, but everyone sees different things," says Morie Mehyou, assistant vice president, information management and decision support at the hospital, the fourth-largest in Arkansas.

Six years ago, when Jefferson first implemented the system, Mehyou says, the medical center came up with a glossary of definitions for key terms, such as patient. But over time and under varying conditions, such definitions can get murky and/or users can interpret them differently.

"We have accountants, nurse managers and supply managers all seeing different things in the same data," says Mehyou.

For example, an administrator viewing the patient census data might conclude that a certain medical department should operate only 11.5 hours a day. But the medical department might disagree, countering that administrators

didn't take into consideration mitigating factors such as the fact that nine of its 10 patients were very sick or that one staffer left early on that particular day.

"It's a continuous education with definitions. You have to always explain the intent and purpose [of all definitions], and if there are any caveats, they have to be apparent," says Mehyou. "Every time we have a new manager, I take the time to bring them up to speed to have consistency in reports. It's a language you have to start talking to people."

Ever-changing government, medical and financial regulations also affect BI definitions. "Every time we have a challenge, we have to come up with another way to slice data and give another explanation of what that data is all about," Mehyou notes.

5. Wrong Plan

The District of Columbia's Court Services and Offender Supervision Agency needed to centralize all of its mission-critical information so it could compare the performance of various departments and realign its public safety resources across the city's eight wards.

"We had different versions of the truth floating around," says Calvin Johnson, director of the agency's office of research and evaluation. "We had one type of report from finance, another from research and a third from operations, which didn't jibe well, especially because we're in the business of public safety."

As part of the requirements-gathering process, Johnson and his team asked users in different focus groups for their three most pressing needs. "We didn't make promises, but we asked, 'Where are your three biggest pains?' " he recalls.

All told, he gathered about 45 urgent requirements — many of them redundant. "When you boiled it all down, it came to five to seven things," Johnson says. His team delivered them all — fast.

"We did not follow best practices, but we developed quick and clean reports that users could access via a portal on a regular basis. We ran these jobs every day and made the information accessible. It was low-cost but big ROI," he says.

"You give them something they can use right away," Johnson advises. "People don't care about pretty. Develop something, even if it's minimal. Develop it, and let people see where you're going."

But at the same time, he says it's critical to think long term, especially in terms of how the IT infrastructure will support BI several years in the future. Most BI systems "undoubtedly will have grown to support features that were not in the original scope," Johnson says.

At the D.C. agency, for example, geographic information systems capabilities are now part of the BI project plan.

"A lot of the data we deal with is spatial — where people live, where crimes take place," Johnson explains. Now, when a homicide takes place, a case worker can pull up a list of all previous offenders, based on the crime they've committed, in a 500-yard radius. Or when staffers are going to be in a certain area of the city, they can find the names and addresses of offenders in that area and conduct random home visits.

This is the bottom line, says Johnson: "You've got to develop an IT architecture not for where you are now, but for where you want to be five years from now."

Change May Come Slowly

QUICK HITS

Top five technologies that yield the fastest payback:

1. Data management/ business analytics
2. Antivirus protection
3. E-mail/groupware
4. Voice-over-IP
5. Storage-area networks

Base: 252 respondents

SOURCE: Computerworld's first-quarter Vital Signs survey, 2007

Business intelligence tools can bring a host of advantages to companies, but IT shops must first ensure that the technology is accepted by business users, says a group of IT executives. They note that IT managers continue to face several obstacles in efforts to convince users of the merits of BI, including difficulties showing a return on investment.

Despite such challenges, Randy Benz, CIO at Energizer Holdings Inc., said the St. Louis-based battery maker turned to BI tools several years ago when its stock price stumbled. The tools helped the company make better decisions, which in turn helped boost its stock price to a $100-per-share level, he says.

"My passion for this process grew from that," Benz says. "We in IT have a very important role in terms of getting information in front of [users] so they can make better decisions."

But Benz also acknowledges that IT employees must work hard even today to convince users of BI's benefits. Some users still "don't realize the power" of BI technology, he says.

Strategic BI Plan

Chris Festog, CIO at Virginia Farm Bureau Mutual Insurance Co. in Richmond, Va., says he was hired about two years ago to help turn around an IT department "that had not performed for years."

The insurer had already made several unsuccessful attempts to replace legacy systems, Festog says. "We had people who weren't performing. We didn't have change management," he notes.

Festog says that he developed a strategic plan that leaned heavily on BI technologies to provide users with "better, more timely and quality information for making better decisions." He also assigned 10% of his staff to focus on BI projects.

Festog notes that despite the increasing investment in BI projects, some users continue to resist the effort.

"I am a change agent in an organization that still isn't sure it wants to change," he says. "My organization actually doesn't want information; they want to manage the organization anecdotally. When we come with data, they don't like us."

However, he says that as IT shows users how the tools can make their jobs easier, many start asking for the ability to get more data.

Stephen Wetzel, chief technology officer for Maricopa County, Ariz., says that when he unexpectedly arrived at a county call center earlier this month, he found employees eagerly discussing BI metrics related to the handling of citizens' calls.

He says discussions about BI would likely have been far less enthusiastic shortly after the county began implementing the technology in 1998.

While some users — especially managers — embraced BI tools, others came on board only when the county began "holding them accountable through the fiscal process" by threatening to cut funding if they didn't use standardized BI tools, Wetzel notes.

Despite having encountered resistance from users, each manager says that he chose not to compile formal estimates of returns on investment before embarking on BI projects.

"You could quantify it; we didn't," says Festog. "I see BI as a fundamental tool for the leadership of the organization. If we can teach these guys how to use the tools, the return is exponential."

"It is as simple as, good decisions are better than bad decisions," says Benz. "You start with that premise and scale your effort. At some point in time, it becomes a little like e-mail. Did you do an ROI when you put in e-mail?"

Because Maricopa County has had to increase spending to meet law-enforcement and health care mandates without increasing taxes, "we had to look at the value proposition of making better decisions" and therefore didn't do a formal ROI study, says Wetzel.

Benz has a piece of advice for companies attempting to use BI to help improve decision-making: Don't wait for unanimous user support. Many data warehouse projects have failed, he notes, because IT waited until it gathered all of the required data.

"If that means that we stumble along the way and are embarrassed, then so be it," Benz adds. "I worry about us screwing it up technologically, but what I worry about more is business performance." ◗

BI TOOLBOX

Right Tool, Right User

Nearly anyone involved in business intelligence technology can recall a horror story that involved giving users too many freedoms with BI tools. Indeed, of any technology that IT is involved with, BI might be the most difficult to deploy when it comes to putting the right tools in the right hands so that the right data is delivered at just the right time.

For instance, three years ago, San Antonio-based Valero Energy Corp. had an array of BI tools because it had gone through multiple mergers and acquisitions. The options included systems from Cognos Inc. and Hyperion Solutions Corp., as well as Crystal Reports, which is now owned by Business Objects SA. A pitfall, says Kirk Hewitt, director of reporting and financial systems at the $82 billion refiner, was that users were running reports off different versions of the data.

"Somebody might take data from the data warehouse, load it onto a Crystal Reports server and do their reporting off the server," he says. "But they might not do an update every morning, so all the data in that report was not consistent with what was in the warehouse the previous night." Valero took measures to solve that problem in 2004, when it began a two-year project to consolidate its BI architecture.

That effort included standardizing on SAP Business Information Warehouse (BW), SAP ERP software and an Oracle data warehouse. Valero also moved all report- and query-building functions into the IT department and chose one front-end tool — Information Builders Inc.'s WebFocus — as well as the online analytical processing (OLAP) capability in SAP BW.

Now, although users can slice and dice and drill down into data using WebFocus, they're using reports built by the IT group and comparing data that has been qualified and structured by IT. "All reporting originates from information services; we no longer have reporting pockets in the business," Hewitt says. "That ensures that we're aware of what the requirements are, that the requests make sense within our infrastructure and that the data is available on a timely and accurate basis."

Some of the People, Some of the Time

Valero isn't the only company that's moving from what might be considered the Wild West era of BI to a more controlled and sophisticated approach. As companies realize the potential of BI implementations, they're also learning how many things can go wrong if they don't standardize tools, work with users on how they want their business intelligence delivered, coordinate with them on creating queries and reports, and ensure that everyone is working off the same set of correctly structured data.

At Del Monte Foods Co., before the company standardized on one set of BI tools, users were free to design their own reports with one of several query and reporting tools, says Andy Wojewodka, director of business systems and decision support. "I found different departments sending performance results

to management on fill rate, but each used a different set of business rules and filtering," he says.

For instance, there was no agreement on which types of orders or businesses should be included or excluded. "Consequently, all reports were 'correct,' but their definitions of 'fill rate' were completely different," Wojewodka says.

"Too much flexibility and ad hoc capabilities in the hands of the wrong person can result in islands of autonomy, homegrown subsystem processes and the proliferation of multiple versions of the truth," Wojewodka concludes. Now, BI analysts in Del Monte's IT group work with end users and developers to determine how best to present information in a meaningful form for business owners' consumption.

Edward Smith, chief information director at Utz Quality Foods Inc., a snack foods manufacturer in Hanover, Pa., had a similar experience. "We've gone down the road of letting users build their own queries, and it didn't work too well," he says. Inefficient queries were bringing the company's main business systems platform, an IBM iSeries server, to a screeching halt.

"They're savvy users, but they didn't understand data structures, and they don't know the data well enough to get the right answer," Smith says. Since 2002, he says, the IT group has taken over designing queries and reports using WebFocus, so users can slice and dice data safely, using efficient queries and correct data structures.

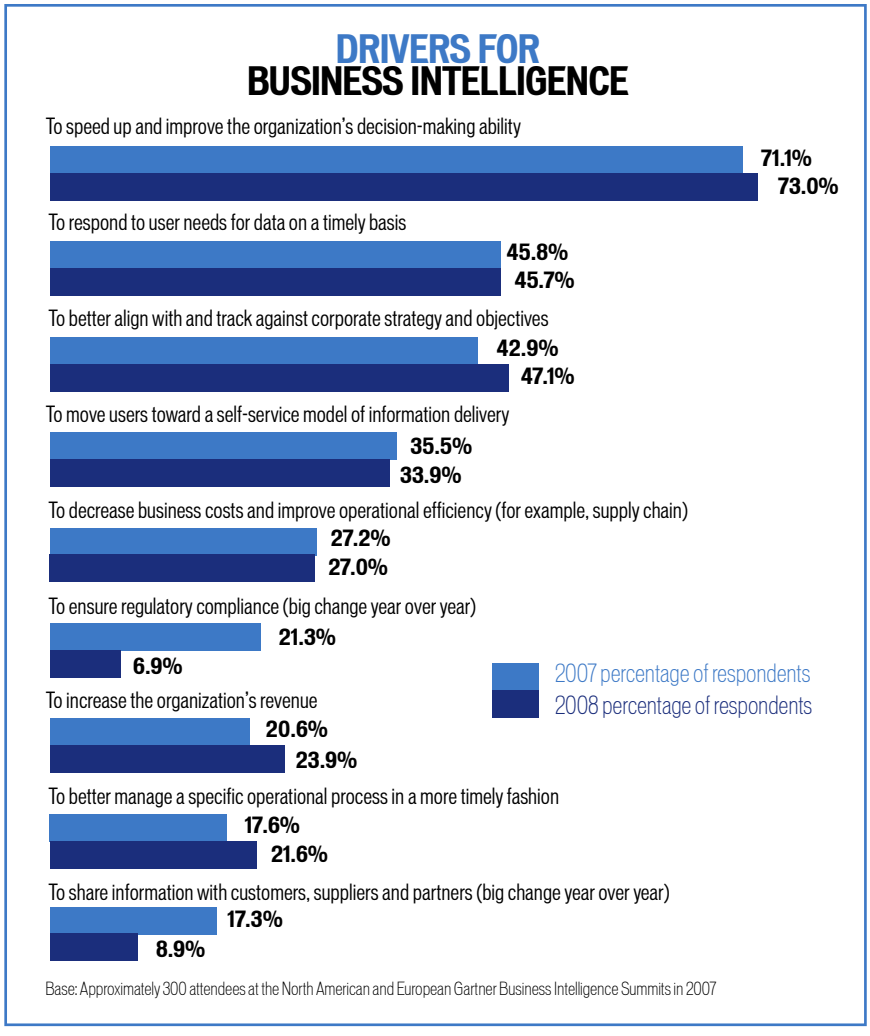
Part of the problem, says Bill Hostmann, an analyst at Gartner Inc., is that the reports and dashboards that get delivered to users are just the tip of the iceberg, and what's underneath — the data integration, qualification, analysis and formatting — is often not adequately funded. "Most people don't appreciate how hard it is to get data in an accessible, controlled, qualified form," he says. "Those are important and difficult pieces of the puzzle."

Know Your Audience

Reining in report- and query-building is just the beginning of the job, however. Getting the right BI tools into the right hands also requires IT to really get to know the user population and all the different needs to be served.

At Del Monte, some managers prefer performance indicators to be delivered by hand at regularly scheduled meetings with face-to-face dialogue, while other users want the freedom to keep a pulse on what's going on, Wojewodka says. "I used to have the misconception that by supplying interactive analytics and reporting and making it intuitive in nature, that it would be embraced by all," he says. "But that isn't the case."

That's why BI analysts not only need to focus on the metrics, reports and analytics, but also need to devote time to understanding the process within a given role, Wojewodka says. This entails spending time with users and understanding the key drivers for their roles. "Delivery should be tailored to the user's area of responsibility in a format that's actionable for him



SOURCE: Gartner Inc., August 2007

or her," he says.

That's exactly how Cindi Howson spends a lot of time: helping companies match tools to individual user segments. "Many users want to be empowered and have faster response time to their questions, but they don't want to become experts in sophisticated tools," says Howson, founder of BI system evaluation site BIScorecard.com and author of Successful Business Intelligence: Secrets to Making BI a Killer App (McGraw-Hill Osborne Media, 2007).

So while IT report developers need tools such as Microsoft Reporting Services and Crystal Reports, business power users would get more benefit from business query tools, she says. Sophisticated Excel users might want BI delivered in an Excel interface, while casual users might want portal-based BI or data delivered via e-mail or in interactive reports.

Higher up in the organization, executives and other managers most likely want a BI dashboard or scorecard. "The information has to be relevant and personalized to the person accessing it," Howson says.

At Valero, some users want their BI delivered in PDF files, while those who want to manipulate the data need Excel spreadsheets, Hewitt says. Still others want reports to be accessible through a Web portal or delivered via e-mail.

"In IS, we understand what the problems and issues are because, in many cases, we came from the business," Hewitt says. For instance, most of the service managers who collect reporting requirements originally worked on the business side of Valero.

We Have the Data, Now What?

Still another challenge is ensuring that people know what to do with the data once they can access it. "Don't assume, 'If we build it, they will come,' " says Wojewodka. "People need to understand how to utilize the information."

"People might have access to data, but they still don't act on it," Howson says. "Companies need to get away from gut-feel decision-making and foster a culture that supports 'What is the data telling me?' versus 'What is my bias telling me?'"

Utz has successfully established a data-driven culture. Sales managers, for instance, are highly aware of current sales in comparison with same-week, year-ago sales — a key retail metric. So when a sales manager queries the data and sees that regional sales are down 10%, he can quickly find out why, Smith says.

"It generates a whole host of questions and gets people to react — maybe a route salesperson was out sick, but why didn't someone pick up that route?" he says. "They're accustomed to looking at the data every day, so we can react to business failures and fix them."

But whether you're transitioning to a data-driven culture or moving away from chaotic and uncontrolled query and report building, you can't overlook the difficulty of change management, Hewitt says. At Valero, it couldn't have happened without the support of top executives like the comptroller and the CIO.

"They really drove the change management of the project, getting us the support we needed so that people would participate," Hewitt says. "Obviously, a lot of end users were affected, and not everyone wants to change."

Hewitt also made sure that end users were involved with the final selection of the BI tool. "They got to try it out and asked a lot of questions: 'Can you get it in Excel? Deliver it through e-mail? Go to the portal? Do OLAP?' Everyone had different requirements," he says.

Making the commitment in time, money and change management necessary to get reporting right is one of the biggest problems in BI today, according to Hewitt. But it's worth it, he says.

At Valero, the change has resulted in users being more confident in what the tools are telling them.

"By having a centralized and consistent data source," Hewitt says, "we're able to provide more people with access to the tools."

SKILLS FOR IT PROFESSIONALS RESPONSIBLE FOR BI

- Process modeling, process improvement methodologies and evaluating workforce productivity
- Integrating business applications with BI applications
- Program and change management
- Supporting more-sophisticated analytic technologies and information access
- Understanding how BI applications can be deployed to address business needs
- Defining and enforcing standards, accountability and governance
- Defining service-level agreements
- Domain-specific information-analysis skills

SOURCE: Gartner Inc. 2007

SEEING THE FUTURE

A Power Couple

The marriage of business intelligence and text analytics is starting to have a profound impact on companies in several industries, including health care, insurance and finance, which are just waking up to the benefits of tying structured BI data to unstructured text.

Text analytics tools use linguistics, rules-based natural-language processing, specialized algorithms and other methods to impose order on unstructured text scattered throughout the enterprise. More IT executives are using text analytics software to mine disparate document- management applications, e-mail and phone systems, or even blogs and Web sites.

The goal is to breathe new life into static BI reports. By extracting facts, concepts and data relationships buried in text, text analytics software transforms this unstructured information into modeled data that can then be tied to BI databases. Hence, text analytics promises to enhance the context and meaning of BI data, which is often presented as canned reports scraped from data warehouses or major applications, such as ERP and customer relationship management (CRM) databases.

Though powerful, the combination of text analytics and BI isn't yet typical. "Most people associate business intelligence with online analytical processing [OLAP], which focuses on structured data, as far as the process and user interface are concerned," says Boris Evelson, an analyst at Forrester Research Inc. in Cambridge, Mass.

"However, to become more effective, OLAP experiences need to bring unstructured data into the analysis in a seamless way that is transparent to the user," he says.

Indeed, despite spending bundles to build sophisticated BI databases, many corporate IT officials find that a lot of vital data stays locked up as text throughout the enterprise, notes David O'Connell, an analyst at Nucleus Research Inc. in Wellesley, Mass.

"Within this data is important competitive, marketing, sales campaign and CRM trend data. However, you can only find and track these trends by automating analysis and combining it with BI," says O'Connell. "By bolting text analytics onto traditional BI applications — a process that is not terribly expensive, since little data cleansing is necessary — the value of BI efforts is extended. Eventually, companies get new ROI on existing BI investments."

Order, Please

BlueCross BlueShield of Tennessee Inc. (BCBS) provides a good example of the benefits of extending BI through text analytics. BCBS has successfully linked the two technologies to hone analysis of the costs of insuring high-risk and low-risk members in four disease categories.

"By combining related structured and unstructured data, we were able to deliver new business insight, enable new forms of analysis and present actionable information to users in the form of enhanced BI," says Frank Brooks, chief data architect and senior manager of data resources and management at the Chattanooga-based insur-

ance provider.

Fueling the BCBS system is Cognos 8 BI Version 8.2 from Ottawa, Ontario-based Cognos Inc. and two text analytics tools: Text Miner from Cary, N.C.-based SAS Institute Inc. and IBM's OmniFind Analytics Edition. Both text analytics tools are playing big roles in a BCBS proof-of-concept application. "[That application] has demonstrated the power of transforming the meaning hidden in unstructured data with the meaning in existing structured data," says Brooks.

SAS's Text Miner manipulates data contained in several file types — PDF, ASCII, HTML and Microsoft Word — and renders text as numerical representation using Singular Value Decomposition technology. These numerical models are packaged to reside in BI clients, including Microsoft Excel and SAS's many BI offerings.

IBM's text analytics offerings mostly center on the Unstructured Information Management Architecture, a product of the company's research division. UIMA uses core algorithms to perform the language processing needed to transform unstructured text into components that can be integrated with middleware and systems like WebSphere Portal Server and Lotus Workplace that often host enterprise BI applications.

Along with insurance giants such as BCBS, financial services firms are also ripe for combined BI-text analytics applications.

For instance, text analytics is applicable to areas such as risk management, according to a recent report by Forrester. The report gives an example in which an antifraud professional at a major financial institution used the two technologies to generate "watch lists" and compile legal discovery documentation that would have been impossible to gather through manual association of data sets.

Financial planning systems provider Kettley Publishing Co. in Newport Beach, Calif., has combined BI and text analytics capabilities to allow its customer base of financial planners to access the most relevant content."BI and analytics turns 'noise' into a form that can actually support and defend decisions," says Jim Connolly, Kettley's director of development.

Kettley developed its text analytics capabilities in-house using Microsoft Windows Workflow Foundation programming model to whip text into shape — an exercise that would serve as a forerunner to stepped-up enterprise search capabilities. "The implementation went smoothly and took less than one person in one month's time to implement," says Connolly.

As software vendors scramble to add text analysis functionality to their BI portfolios, systems integrators will be the first to capitalize on corporate interest in the combined systems, says Forrester's Evelson.

"This is still very much an integration game," he says. "So in addition to investment in software, one needs to budget at least $3 to $5 on systems integration for every $1 spent on software."

A PERSONAL TALE

For Patricia Cerrito, professor of mathematics at the University of Louisville, the gulf between BI and text presented potentially devastating repercussions. Inflicted with diabetes and osteomyelitis, an inflammation of the bone caused by infection, Cerrito's husband faced the possibility of an amputation right below the knee.

An alternative treatment involved a particular antibiotic, but the doctors were reluctant to OK it unless Cerrito could provide information on dosage and side effects. "The physician was aware that we had expertise in this area, but ultimately, the leg belonged to my husband," she says.

To gather the information requested, she ultimately gleaned structured BI prescription data and combined that with anecdotal information prepared by individual physicians.

Trouble was, patient information prepared by physicians tends to be scattered in disparate document management applications and other systems. "In medicine, physicians are independent entrepreneurs. For this reason, change is slow, especially when it involves changing the perspective of disease management," says Cerrito.

Now, Cerrito says she is determined to help make available more information on alternative treatments for particular diseases by creating interfaces between structured BI databases and unstructured text.

Through the use of SAS Text Miner, "it is now possible to examine sequences of decisions by creating text strings from multiple columns of information," she says. Text Miner plows through these text strings, formatting and classifying documents after detecting relationships between pieces of text-based information. In this way, Cerrito, her husband and her students are able to delve into data housed in hospital billing systems and physician chart notes.

GLOBAL VIEW

Traffic Problem Finds Solution

The burgeoning population of road vehicles in Bangalore, India, is widely seen as a sign of the change in its economic landscape. In the literal sense, though, the landscape has posed a string of issues for governance, the traffic police on the ground and the common man. But, as most analysts have stated in recent times, the lack of a single view among governing bodies is a critical factor that has compounded traffic management.

Given this backdrop, the Bangalore Traffic Information System (BTES) is a fresh project that is expected to provide a far more accurate definition of the traffic problem. It could go some way toward developing a common view of the issue before arriving at micro- and holistic solutions. Little wonder that M.N. Reddi, additional commissioner of police-traffic in Bangalore City, is excited about the latest public-private initiative.

Reddi researched similar projects that provide live information via text messages about traffic-congested zones, speeds of vehicles in certain areas and directions from one point in the city to another. As a city synonymous with India's IT industry, the technology application seemed almost inevitable in Bangalore, says Reddi.

The initiative is based on Mapunity Information Services, an application developed by the N.S. Raghavan Center for Entrepreneurial Learning (NSRCEL) at the Indian Institute of Management, Bangalore. The geospatial application is written in Ruby on Rails, an open-source system, and uses the Postgis/Postgres database. In addition to these technologies, application programming interfaces such as Google Maps and Open Layers would be used to provide spatial information.

The NSRCEL offered its geographic information systems for the project and sought to work out a real-time monitoring technology based on cell phones. With support from Reddi's traffic police force at one end, Mapunity tied up with Bharti Airtel at the other to use its service and towers toward this end.

Destination mobility

The logic of the system is based on cell phone congestion, says Ashwin Mahesh, CEO of Mapunity. "The idea is simple: If phones are proxy for people, as in highway traffic planning in many parts of the Western world, the congestion of phones will be proxy for congestion of people." So, the system called for installation of microtowers in select congested areas at traffic crossings, which was taken care of by Bharti Airtel.

The permissions to erect these towers, as well as the selection of the spots that would yield maximum data, were overseen by Bangalore traffic police. "As part of the administration, we drove the project and provided support to Airtel to put up the towers in extremely congested crossings," says Reddi.

"There are 700 new vehicles being added to Bangalore's choked roads ev-

ery day. Infrastructure can't keep pace with it, so there has to be some monitoring mechanism. For BTIS, Mapunity provides the grey cells, Airtel is the facilitator, and the traffic police is the user of the data. With the information, we can take traffic-related decisions," he explains.

In effect, the information system monitors traffic densities — as indicated by cell phone signal congestion — to provide data in real time on the pattern of movement at different locations between towers. This forms the first step toward planned movement in the city roads. The data can be located geospatially at any time on a city map by Bangaloreans on the Web site or received by commuters through Short Messaging Service (SMS).

Currently, 150 towers have been installed, and about 70 have been put up by Airtel solely for this initiative. Further, cameras have been installed at critical points to capture live feeds.

"We have installed up to eight cameras at various points. Essentially, we are looking at an object recognition algorithm and accounting algorithm that will look at those feeds in real time," says Mahesh, who also wants to develop various systems that deliver information since the amassed data has several uses.

"Right now, it's on the Web and SMS. But, we'd like to create a product that can be used from radio stations and in hotel lobbies. It could be a plasma screen in the lobby with live feeds," he adds.

This will benefit travelers, for instance, who can work out alternative routes if the common road to the airport is blocked. Large displays would also be useful at software technology parks because there is a lot of traffic originating and ending in such large complexes.

While commuters can be aware of particularly congested roads that can be avoided, the traffic control room plans to use the data for better transportation route planning.

The broad agreement between the key stakeholders is that the traffic police department will facilitate the tower installation in congested junctions, Airtel will map the traffic patterns, and Mapunity will process the data to turn it into readable traffic information for the end user.

"We all had a congruent interest," says Mahesh. "For any telecom service provider, congestion means a drop-off. Airtel wanted the network to reach into congested areas, too. They were interested in serving people in junctions where congestion typically takes place. They were coming up with microtowers, which will have a limited footprint, serving only people in that limited area of the junction. It would not be handled by the overlying BTF layer that would otherwise handle telecommunications traffic.

"So, Airtel wanted a solution for call drops at intersections; the traffic police only needed to map people at the intersection; we could use these micro-towers to get our data," Mahesh explains.

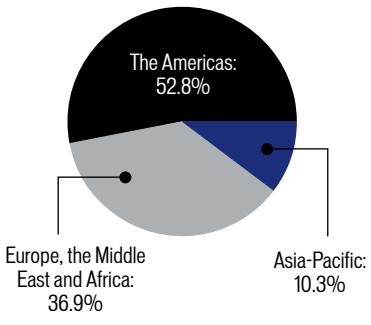
The Web site was launched on June 1 and carries detailed traffic and movement coverage for the eastern and southern parts of the city. In the next phase, they plan to extend the service to northern and western Bangalore.

Other services include safety instructions, information on roads and diversions in the city, level-of-service mapping, passenger information system, and origin-destination studies and route optimization. The service will remain free for a few weeks before becoming a paid service, paving the way for a strong revenue model for the Web site.

Two weeks into its operation, the Web site is getting about 4,000 requests on SMS every day. The numbers seem to be growing by about 5% per day. The site has been getting another 2,000 people, some of whom inquire about new services.

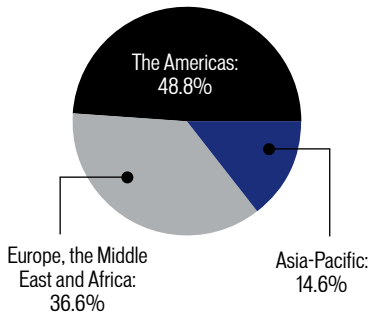
"The car-pool service, for instance, is not operational. Yet, a few dozen have called in and shown interest in being notified when the car-pool service begins," Mahesh says.

WORLDWIDE BUSINESS INTELLIGENCE TOOLS REVENUE SHARE BY REGION, 2006



SOURCE: IDC June 2007

WORLDWIDE DATA WAREHOUSE PLATFORM TOOLS REVENUE SHARE BY REGION, 2006



SOURCE: IDC June 2007

The long horizon

The biggest takeaway of the traffic information system has been the data on commuting patterns. Earlier, it could take months to do a physical survey of a few thousand households in a locality to study their commuting patterns. On the other hand, with cell phone signals, Mahesh says, "I can give you data about a million and a half households by tomorrow morning." By mapping movements onto a network and a dynamic capture system, transport planning has become not just faster, but more also flexible.

"Cell phone signals provide very easy data feed. Companies can also use this data to ascertain major populated areas, work locations, heavy traffic roads, buses and other modes of transport," notes Mahesh.

Reddi says there is a larger purpose behind the whole exercise. "The traffic police department has two major advantages from this project," he explains. "First of all, with this data, congestion mapping will be at the fingertips of our traffic personnel and every cop will have information of sensitive areas. So, regulation can be easy. This database will help us identify problem areas without waiting for human intervention. Secondly, this is a step toward setting up a traffic management center in a few months in Bangalore."

The center will consist of a large number of cameras feeding a large media wall for constant real-time monitoring as well as analysis of the information coming in. BTIS will be an important source of this information.

> "The idea is simple: If phones are proxy for people, as in highway traffic planning in many parts of the Western world, the congestion of phones will be proxy for congestion of people."
>
> **ASHWIN MAHES**
> **CEO OF MAPUNITY**

It will feature a help line, live video streams and call-in information from users. An accident detection system is also on the anvil.

"All of this will be integrated into the traffic management center," says Reddi. "This will give us ample information to asses a situation. Then, we can take subjective field action. This will also ensure a transparent traffic control system."

"Besides, the advantage of using cell phone data to trace density of traffic is that information based on this can give out very good [origin density] statistics, telling us where the traffic is originating, which direction it is moving and the accurate congestion situation," he adds.

There are about 1,200 spatial locations in the database, monitoring about 200 junctions using Airtel's microtowers. In time, people will be allowed to customize these locations, identifying them with keywords like "home" and "office."

The car-pool system will also have a group messaging platform that makes it possible to query many pool partners at the same time, thereby increasing the likelihood that at least one of them will be able to share on a given day.

The BTIS initiative has called for tremendous man-hours in terms of investment, asserts Mahesh.

"We put in about six to eight months into this project. The traffic police personnel also invested a good amount of time and effort — there were eight constables and five ACPs who were working on this, in addition to their regular duties," he explains.

"Toward the end of the project, Airtel put in about 1 million rupees ($24,456 U.S.) for the final expenditures. So, I think the investment in this project is more in terms of effort than money." It's what Mahesh deems a social entrepreneurship project.

For Reddi, the initiative is another step in the direction of tech-enabling the Bangalore traffic police. It's a bid to systematize what otherwise translates to complete chaos on the roads of Bangalore, especially at peak hours. In a few months, when the traffic management center is up and running, Bangalore and its harried commuters should get some relief — or, at the very least, there will be a method to the madness they encounter.