

A GUIDE TO BETTER BUSINESS SMARTS

Business intelligence software is a hot enterprise IT technology, being embraced by companies that want to analyze data and make smarter decisions. It dovetails with business process management, which fosters ongoing collaboration between IT and business users to jointly build applications that effectively integrate people, process and information. Toss in some predictive analytics, with its ability to enable business forecasting, and a company has a software lineup capable of crafting better strategies, building new, targeted products and achieving operational savings. In these articles, *CIO*, *Computerworld*, *InfoWorld* and *Network World* provide an overview of BI, BPM and predictive analytics and a guide to doing each well.

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BUSINESS INTELLIGENCE DEFINITION AND SOLUTIONS

By Ryan Mulcahy • CIO

BI defined, plus objectives, systems and solutions

» Business intelligence, or BI, is an umbrella term that refers to a variety of software applications used to analyze an organization's raw data. BI as a discipline is made up of several related activities, including data mining, online analytical processing, querying and reporting.

Companies use BI to improve decision making, cut costs and identify new business opportunities. BI is more than just corporate reporting and more than a set of tools to coax data out of enterprise systems. CIOs use BI to identify inefficient business processes that are ripe for re-engineering.

With today's BI tools, business folks can jump in

and start analyzing data themselves, rather than wait for IT to run complex reports. This democratization of information access helps users back up—with hard numbers—business decisions that would otherwise be based only on gut feelings and anecdotes.

Although BI holds great promise, implementations can be dogged by technical and cultural challenges. Executives have to ensure that the data feeding BI applications is clean and consistent so that users trust it.

What kind of companies use BI systems?

Restaurant chains such as Hardee's, Wendy's, Ruby Tuesday and T.G.I. Friday's are heavy users of BI soft-

ware. They use BI to make strategic decisions, such as what new products to add to their menus, which dishes to remove and which underperforming stores to close. They also use BI for tactical matters such as renegotiating contracts with food suppliers and identifying opportunities to improve inefficient processes. Because restaurant chains are so operations-driven, and because BI is so central to helping them run their businesses, they are among the elite group of companies across all industries that are actually getting real value from these systems.

One crucial component of BI—business analytics—is quietly essential to the success of companies in a wide range of industries, and more famously essential to the success of professional sports teams such as the Boston Red Sox, Oakland A's and New England Patriots.

THE CHURCH OF THE BETTER MOUSETRAP

Once you get salespeople on board, you can use them to help get the rest of your organization on the BI bandwagon. They'll serve as evangelists, gushing about the power of the tools and how BI is improving their lives.

With an analytical approach, the Patriots managed to win the Super Bowl three times in four years. The team uses data and analytical models extensively, both on and off the field. In-depth analytics help the team select players and stay below the NFL salary cap. Patriots coaches and players are renowned for their extensive study of game film and statistics, and Coach Bill Belichick reads articles by academic economists on statistical probabilities of football outcomes. Off the field, the team uses detailed analytics to assess and improve the “total fan experience.” At every home game, for example, 20 to 25 people have specific assignments to make quantitative measurements of the stadium food, parking, personnel, bathroom cleanliness and other factors.

In retail, Wal-Mart uses vast amounts of data and category analysis to dominate the industry. Harrah's has

changed the basis of competition in gaming from building mega casinos to analytics around customer loyalty and service. Amazon and Yahoo aren't just e-commerce sites; they are extremely analytical and follow a “test and learn” approach to business changes. Capital One runs more than 30,000 experiments a year to identify desirable customers and price credit card offers.

Who should lead the way?

Sharing is vital to the success of BI projects, because everyone involved in the process must have full access to information to be able to change the ways that they work. BI projects should start with top executives, but the next group of users should be salespeople. Because their job is to increase sales and because they're often compensated on their ability to do so, they'll be more likely to embrace any tool

that will help them do just that—provided, of course, the tool is easy to use and they trust the information.

With the help of BI systems, employees modify their individual and team work practices, which leads to improved performance among the sales teams. When sales executives see a big difference in performance from one team to another, they work to bring the laggard teams up to the level of the leaders.

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How should I implement a BI system?

When charting a course for BI, companies should first analyze the way they make decisions and consider the information that executives need to facilitate

more confident and more rapid decision-making, as well as how they'd like that information presented to them (for example, as a report, a chart, online, hard copy). Discussions of decision making will drive what information companies need to collect, analyze and publish in their BI systems.

Good BI systems need to give context. It's not enough that they report sales were X yesterday and Y a year ago that same day. They need to explain what factors influencing the business caused sales to be X one day and Y on the same date the previous year.

Like so many technology projects, BI won't yield returns if users feel threatened by, or are skeptical of, the technology and refuse to use it as a result. And when it comes to something like BI, which, when implemented strategically, ought to fundamentally change how companies operate and how people make decisions, CIOs need to be extra attentive to users' feelings.

Seven steps to rolling out BI systems:

1. Make sure your data is clean.
2. Train users effectively.

3. Deploy quickly, then adjust as you go. Don't spend a huge amount of time up front developing the "perfect" reports because needs will evolve as the business evolves. Deliver reports that provide the most value quickly, and then tweak them.
4. Take an integrated approach to building your data warehouse from the beginning. Make sure you're not locking yourself into an unworkable data strategy further down the road.
5. Define ROI clearly before you start. Outline the specific benefits you expect to achieve, then do a reality check every quarter or six months.
6. Focus on business objectives.
7. Don't buy business intelligence software because you think you need it. Deploy BI with the idea that there are numbers out there that you need to find, and know roughly where they might be.

What are some potential problems?

User resistance is one big barrier to BI success; others include having to winnow through voluminous amounts of irrelevant data and poor data quality.

The key to getting accurate insights from BI systems

is standard data. Data is the most fundamental component of any BI endeavor. It's the building blocks for insight. Companies have to get their data stores and data warehouses in good working order before they can begin extracting and acting on insights. If not, they'll be operating based on flawed information.

Another potential pitfall is BI tools themselves. Though the tools are more scalable and user friendly than they used to be, the core of BI is still reporting rather than process management, although that's slowly beginning to change. Be careful not to confuse business intelligence with business analytics.

A third impediment to using BI to transform business processes is that most companies don't understand their business processes well enough to determine how to improve them. And companies need to be careful about the processes they choose. If the process does not have a direct impact on revenue or the business isn't behind standardizing the process across the company, the entire BI effort could disintegrate. Companies need to understand all the activities that make up a particular business process, how information and data flow across various processes, how data

is passed between business users, and how people use it to execute their particular part of the process. And they need to understand all this before they start a BI project, if they hope to improve how people do their jobs.

What are some benefits of business intelligence efforts?

A broad range of applications for BI has helped companies rack up impressive ROI figures. Business intelligence has been used to identify cost-cutting ideas, uncover business opportunities, roll ERP data into accessible reports, react quickly to retail demand and optimize prices.

Besides making data accessible, BI software can give companies more leverage during negotiations by making it easier to quantify the value of relationships with suppliers and customers.

Within the walls of the enterprise, there are plenty of opportunities to save money by optimizing busi-

ness processes and focusing decisions. BI yields significant ROI when it sheds light on business bloopers. For example, employees of the city of Albuquerque used BI software to identify opportunities to cut cell phone usage, overtime and other operating expenses, saving the city \$2 million during three years. Likewise,

with the help of BI tools, Toyota realized it had been double-paying its shippers to the tune of \$812,000 in 2000. Companies that use BI to uncover flawed business processes are in a much better position to successfully compete than companies that use BI merely to monitor what's happening. •

Five Tips for Getting BI Right

1. **Analyze how executives make decisions.**
2. **Consider what information executives need in order to facilitate quick, accurate decisions.**
3. **Pay attention to data quality.**
4. **Devise performance metrics that are most relevant to the business.**
5. **Provide the context that influences performance metrics.**

And remember, BI is about more than decision support. Due to improvements in the technology and the way CIOs are implementing it, BI now has the potential to transform organizations. CIOs who successfully use BI to improve business processes contribute to their organizations in more far-reaching ways than by implementing basic reporting tools.

SMART AND CHEAP: HOW TO IMPROVE BUSINESS INTELLIGENCE ON A TIGHT BUDGET

By Robert L. Mitchell • Computerworld

You don't need new analytic tools to gain insight into your business. Here's how to make the most of what you've got

»» “Use it up. Wear it out. Make it do. Or do without.” That adage from the Great Depression is making a comeback these days among corporations that are digging deep to maintain profitability using business tools they already have in-house.

One of those companies is Creativity Inc., which two years ago was facing a serious threat to its business model.

The company, which designs crafting products and markets and distributes its wares to specialty retailers, was being undercut by overseas manufacturers as retailers began to buy direct. The trend preceded

the current economic downturn, but it hit with renewed vigor when the recession deepened.

“We’ve been adjusting to a changing landscape,” says Jim Mulholland, vice president of IT, and that includes fundamentally changing the Van Nuys, Calif., company’s product strategy.

To find more profitable, less commodity-driven products, and to cut operating costs, Creativity turned to its existing stable of Cognos business intelligence software. “We made no new purchases at all. We are taking advantage of different parts of the Cognos system, like Event Studio,” a Web-based events-management module, Mulholland says.

The economy has companies scrambling to use BI to find operational savings and to refocus their product lines and strategies, says Nick Millman, senior director for information management services at Accenture Ltd.

But IT organizations aren’t rushing to buy new business intelligence software or build new data warehouses. Instead, they’re digging deeper and doing more with existing tools from BI vendors such as IBM’s Cognos unit, SAS Institute Inc., SAP AG’s Business Objects unit and Microsoft Corp. “Organizations are trying to utilize their existing business intelligence tools without going out and buying more hardware and software,” Millman says.

Millman and others suggest the following strategies to squeeze more out of your existing tools while giving your business an extra boost.

1. Consolidate Your Tools

“Usually people have more tools than they need, and that can be distracting,” says Anthony Abbattista, vice president of technology solutions at Allstate Insurance Co. in Northbrook, Ill., and a former business intelligence consultant. Those organizations end up with “different pockets of people doing similar analysis with different tools,” he says.

His recommendation: Consolidate, and be aggressive about it. “Get to the minimum number of tools you need to get the job done.”

Over the past few years, Abbattista has overseen the consolidation of 13 data warehouses down to just two and has pushed Allstate from a centralized business intelligence function to a self-service model based on the deployment of customizable dashboards.

Settling on a standardized set of tools was the first step toward empowering business managers and analysts. Abbattista says the company “killed off” two-thirds of the tools it was using, including redundant products and “falling stars”—yesterday’s hot tools that are no longer considered leading-edge.

Those efforts paid off before a single new report

was created. The business saved on software support and licensing costs, and the simplified tools portfolio made user training easier.

Standardizing on a single set of tools also made it easier for different groups to share and reuse models. Before, for example, the sales and finance groups had separate profitability models that they had created using different tools. “If they got different results, you’d spend time trying to rationalize why that was,” Abbattista says. Now different units can feel confident that they’re comparing apples to apples.

2. Let Business Take the Driver’s Seat

It’s more important than ever for companies to make sure that BI technology is being applied to solve the right business problems. IT organizations still fall into the trap of putting their technology out front rather than creating models that respond to changing business needs, says Millman.

The key is to work with the business before developing new information models. “Start with a clear vision of how information will generate value for the organization,” Millman says. “Think about what busi-

ness interventions you hope to derive from BI tools. Understand where the business benefit is going to come from, then configure the tools and processes.”

At Allstate, two areas of focus are managing loss expense ratios and measuring the effectiveness of the call center. “We’ve taken experts in the tools and methods and put them together with the business people to find these high-value targets,” says Abbattista.

The temptation in larger organizations is to try to do too many things with BI, he observes. Having fewer tools helps with that problem, but management also needs to prioritize what is most important.

“These times have been good because they’ve brought focus on measuring fewer things well,” says Abbattista. Allstate’s management is watching 10 or 12 different metrics, he says. While business intelligence tools used by the business units include a wider range of metrics, they are all designed to support the upstream metrics that management is watching.

3. Use New Data Models for New Markets

Right now, says Gartner Inc. analyst Bill Hostmann, “there’s a big strategy change in many organiza-

WHEN ALL YOU HAVE IS BI EVERYTHING LOOKS LIKE A NAIL

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tions from high-value product offerings to low-cost offerings.” But businesses that can’t compete in the low-cost market must figure out a way to move up the value chain—and they’re using BI tools to get there.

Which is what Creativity did. To combat the commoditization trend in its core markets, it used the Cognos 8 BI suite to identify and develop high-value products that couldn’t be easily commoditized by its low-cost competitors.

It started by purchasing transactional data from retailers in the toy, fashion and apparel markets, adding that data to its existing data warehouse, and analyzing buying trends. Creativity also uses Belmont, Mass.-based Smart Software Inc.’s SmartForecast forecasting software.

All that analysis has led to more “design-oriented, fashion-oriented” products, such as a line of paper dolls based on the television show Project Runway.

The strategy appears to be working. Creativity’s fashion-based offerings and its other unique designs have become the dominant portion of its business, accounting for more than 50% of its sales and representing an even greater percentage of its margins, Mulholland reports.

4. Centralize Business Intelligence

To help identify the right areas to focus on, Mulholland started an analytical “center for excellence,” a group that includes representatives of different parts of Creativity, from sales to operations. “You’re trying to elevate the IQ of everybody in your company in

terms of knowing the key business metrics and measuring them accurately and in a timely way across all areas of the business,” he says.

Moving toward that goal, Creativity developed common tool sets and profitability models for its sales and finance groups. Reports are pushed to the desktops and viewed in dashboard applications. From there, Mulholland says, users “can go in and do further analysis.”

IBM has been promoting such centers among its Cognos customers as a way to create a standardized set of models using existing business intelligence tools. A set of BI dashboards developed for one department, for example, can be extended to other units. That way, new groups don’t have to reinvent the wheel and can get up and running more quickly.

5. Put More Data in Your Warehouse

The current economic downturn is a great time for organizations to review what they're tracking and to add more data from business operations into their data warehouses to find additional savings. Just be very selective about what you add, experts advise.

Anne Milley, director of technology product marketing at SAS Institute, suggests adding data from call centers, Web logs or other sources. The question companies have to ask in these times, she says, is, "What do I have that I can get into the data warehouse at a relatively low cost?"

As sales slowed at Creativity during the downturn, Mulholland and the center for excellence team changed their focus from keeping up with growth to cutting costs. One project involved providing a feedback loop linking the back-end ERP system and the CubiScan system that's used for shipping.

CubiScan is a laser-based scanning and weight-measurement system from Quantronix Inc. that's designed to ensure that goods are properly packaged to meet customer specifications. (If they're not, the penalty fees can be "considerable," Mulholland says.)

While the ERP system issued packaging instructions with the orders, the stand-alone CubiScan system wasn't returning data on whether shipments were actually packaged properly—and many were not. "There was no feedback loop," Mulholland says.

The IT team used the Cognos ETL (extract, transform and load) tool to bring the CubiScan data into its data warehouse and then built exception reports for shipments where specifications for package dimensions hadn't been met. Mulholland expects the project to pay for itself in three to five months.

6. Make Better Use of Data You Already Have

In some cases, doing "more with less" may simply be a matter of taking data that users already have and presenting it to them in a more useful way. At the Wisconsin Department of Revenue's Business Intelligence Services Bureau, Director Janna Baganz says her organization found a way to present a multiyear view of tax data on a single screen. "That proved to be a timesaver," she says.

Her group also worked to combine data from the state's income processing and audit systems, relieving

analysts of the need to do exception report analyses. Now, when certain business rules kick out a tax return from the processing system, the staff no longer spends 20 minutes running a manual report on another system and then reviewing it to resolve the issue.

Instead, the integrated systems automatically resolve the problem between themselves and process the claim in about two minutes—without staff involvement. Since July 2008, the department has saved approximately 1,750 hours of staff time and taxpayers get their refunds faster, says Pat Lashore, administrator of the department's technology services division.

In a similar vein, Allstate has had success pushing report-creation and -customization capabilities out to end users through the deployment of dashboards. Previously, the company had a centralized report-writing function within IT, and "it took a lot longer to get answers into the hands of business people," Abbattista says. Now his team creates dashboards, walks users through the basics of using the tool and lets them do the rest.

Back in the IT department, the self-service BI tools helped Abbattista's team get out of the report-building business and clear out a long backlog of report

requests. Through the self-service initiative and data warehouse consolidation, he has reduced head count by two-thirds while expanding access to self-service BI tools to 25,000 users.

7. Help Users Understand the Data, Not Just the Tools

Scaling up the number of users who have access to BI tools won't help unless people know how to use those

tools. But that's not the biggest issue when it comes to educating users. "The trend has been for the front end to get simpler and more intuitive," Millman says. And certainly dashboards have helped in that regard.

"What's often missing is the explanation of where the data comes from and how you can use it to derive some insight," Millman says.

For example, the data generated by Creativity's CubiScan system was foreign to business people in the back office.

"We have to explain what the data points are and what the data points mean," Mulholland says.

Allstate focuses on building that knowledge one user at a time. "We build out initial capabilities with front-line managers and people in the trenches," Abbattista says. "They then become the consultants to people around them.

"It's really [about] teaching people to mine for value," Abbattista explains. In that respect, he says, "I don't think we'll ever be done with our BI efforts." •

PROFESSORS CITE CHALLENGES IN TEACHING BI

By Chris Kanaracus • IDG News Service

Some say they need better resources and that business students require more tech savvy

➤ Although BI (business intelligence) is one of the hottest areas of enterprise IT, college professors around the world say they face a variety of challenges in training the next generation of BI workers, according to a new study.

Study author Barbara Wixom, an associate professor at the University of Virginia, received responses from 85 institutions worldwide. Wixom is also co-executive director of Teradata University Network, a learning portal sponsored by Teradata that has participation from vendors such as MicroStrategy.

Mike Goul, a professor at Arizona State University who took part in the study, said he struggles to find “real-life” data sets, culled from actual company data, instead of textbooks, in order to make sure “students

don’t play with toy problems ... so they understand that things are messy,” he said.

In addition, available BI case studies often give a good overview of a project’s business goals, but don’t provide enough technical information, as companies are loath to reveal such details, he said.

Many students today initially shun computer science studies because “they think that it’s something that’s going to be outsourced or offshored before you know it,” Goul added. “One of the interesting things about BI is that it’s easy to explain to both parents and students that this is a non-commodity skill set.”

Major trends such as health-care reform are going to generate a lot of BI-related hiring moving forward, Goul

said. “The big challenge is getting this message across.”

While some of BI’s grunt work—such as developing basic reports—could be vulnerable to offshoring, that’s not the case for more advanced skills as well as for emerging areas like predictive analytics, Goul said.

“Part of the job that has no danger of being outsourced is the people who are the business analysts,” added professor Hugh Watson of the University of Georgia’s Terry College of Business.

In contrast to Goul, Watson expressed few worries about the availability of training materials or software.

“Now there’s a lot of good resources available. They’re so good I don’t even use a textbook anymore,” he said. Sources such as Teradata’s university portal, along with organizations such as The Data Warehousing Institute provide ample pickings, he said.

“Resources aren’t really the particular problem. The broader problem for business schools in general,

MODERN-DAY RENAISSANCE MEN

The real key is for students to develop both technical acumen and business savvy, since many companies are now working to evolve department-level BI efforts to enterprise-wide deployments

is the kind of hands-on skills we're providing our students is not where they need to be." These students tend to be familiar with Microsoft Word or Excel, but that's about it, he said.

Therefore, finance or marketing students should be encouraged to minor in information systems, Watson said.

He recalled a case study involving a bank that had turned to BI to improve customer relations. Previous-

ly, the bank's strategy "consisted of tellers giving out balloons and [lollipops] at the teller line."

"The bank head said, 'before we went to BI, we had 12 marketing analysts,'" Watson said. After the project was complete, there were still 12 positions, "but none of the same people were in the same jobs. They either couldn't handle the analytics or didn't want to."

But the real key is for students to develop both

technical acumen and business savvy, since many companies are now working to evolve department-level BI efforts to enterprise-wide deployments, he added: "There are a lot of organizational and management issues. We need to turn students out who are ready to help with that." •

The IDG News Service is a Network World affiliate.

BUSINESS PROCESS MANAGEMENT DEFINITION AND SOLUTIONS

By Mark Cooper and Paul Patterson • CIO

BPM defined, plus objectives, systems and solutions

>> What is BPM?

BPM is a systematic approach to improving a company's business processes. For example, a BPM application could monitor receiving systems for missing items, or walk an employee through steps to troubleshoot why an order did not arrive. It is the first technology that fosters ongoing collaboration between IT and business users to jointly build applications that effectively integrate people, process and information.

BPM gives an organization the ability to define, execute, manage and refine processes that involve human interaction, such as placing orders; work with multiple applications; and handle dynamic process rules and changes, not just simple, static flows (think

tasks with multiple choices and contingencies).

Important components include process modeling (a graphical depiction of a process that becomes part of the application and governs how the business process performs when you run the application), and Web and systems integration technologies, which include displaying and retrieving data via a Web browser and which enable you to orchestrate the necessary people and legacy applications into your processes. Another important component is what's been termed business activity monitoring, which gives reports on exactly how (and how well) the business processes and flow are working.

Optimizing processes that involve people and dy-

namic change has been difficult historically. One barrier to optimization has been the lack of visibility and ownership for processes that span functional departments or business units. In addition, the business often changes faster than IT can update applications that the business relies on to do its work, thus stifling innovation, growth, performance and so on. But today, the pervasiveness of Web browsers and the emergence of simpler application integration technologies such as SOAP/XML have enabled IT to deploy technology that supports the business process across functional, technical and organizational silos.

Can I see a quick example?

Suppose a large retailer buys an HR application to improve human resource management capabilities. The HR department, located at corporate headquar-

COME TOGETHER

[BPM] is the first technology that fosters ongoing collaboration between IT and business users to jointly build applications that effectively integrate people, process and information.

ters, gets the new application and probably improves its HR department processes to take advantage of the software's features. However, the day-to-day activity of hiring, firing, pay changes and so on happens at the stores, rather than at corporate headquarters. Store managers don't use the application directly; they send information to headquarters and HR analysts to input it into the system. Through the use of Web and integration technologies, BPM provides store managers a defined process and user interface for performing each of the HR transactions they need to, enforces the business rules that HR needs, and submits transactions to the HR and related applications automatically.

Here's another: Consider a retail call center representative who uses a Web-based application that

walks him through how to return two items from separate purchases with two different forms of payment bought weeks apart (so governed by different parts of the exchange policy). What a BPM application would do is walk them through the steps of the exchange. Rules are built into the system so there's no need to call for a manager's consultation or approval (unless the program directs him to do so).

To complete the transaction, the BPM application must call on siloed legacy applications that hold necessary information—for example, customer, inventory or logistics data. But to the call center rep, completing the product return appears as a seamless series of tasks. He is spared the effort of hunting down the siloed information himself. The application he uses is powered by a BPM platform that provides tools for:

- Business analysts to model (and change) the product return processes and define the business rules that control how those processes behave
- IT to integrate the necessary legacy systems
- Joint teams to build applications for the end user that enforce the process and rules
- Management to review process performance (for example, time to resolve client return exceptions) and even adjust process parameters in real-time (for example, increasing the dollar threshold during peak periods to trigger management review and approvals of client returns)

With the leading BPM platforms, everyone is working on the same shared model, so changes to the

process can be put into production very quickly. These platforms are called BPM suites (BPMS) because they provide integrated process modeling, real-time monitoring, Web-based applications and management reporting—all working together to support rapid process innovation.

What does BPM provide that other enterprise applications do not?

BPM suites are integrated toolkits for building and managing tailored solutions based on a company's unique business processes. Other enterprise applications typically consist of prebuilt functionality, such as a human resource management application, with some capability to tailor the base functionality through configuration options. This usually means that companies implementing an enterprise application must choose between accepting the vendor's prebuilt business process behavior or paying the vendor to make expensive modifications that make upgrades costly or impossible. In contrast, BPM enables a company to cost-effectively and quickly model and change its business processes to meet the specific

needs of the business.

Some enterprise applications have introduced workflow capability into their products to give users some ability to control the process behavior of documents such as an invoice or an engineering specification. BPM goes beyond traditional workflow applications in two ways.

First, most enterprise application workflow is implemented through code. This means that programmers must develop and maintain it. BPM uses graphical process modeling tools that enable business users and business analysts—those most familiar with the process—to implement and manage the process definition.

Second, workflow of the typical enterprise application is generally limited to document or task routing. BPM enhances workflow routing by providing an integrated capability to include rich user interfaces, system integration, rule processing (the rules necessary to determine which path you should take next in a process that has multiple paths—for example, an order less than \$500 does not need manager approval, but over that amount it does) and event handling (for

example, steps necessary after a product recall: “Pull from shelves” notification must be sent to the chain of stores).

BPM is often used to integrate multiple enterprise applications and various internal and external users into a new process. Enterprise application integration products help you move data between applications; BPM adds interaction with people and the ability to support long-lived processes. People are involved in two ways:

From a worker point of view. BPM represents units of work from the business process as tasks; each task contains work instructions, status, priority, due date and other attributes. Workers use BPM to monitor and execute the tasks that are assigned to them or to the workgroup to which they belong.

From a manager or executive point of view. Managers and executives use BPM to monitor process performance by viewing graphical reports that summarize task status and alert them to process bottlenecks. They also frequently get involved with tasks by

participating in approval or escalation process steps.

Many BPM products provide real-time insight into the process operation. The process-flow model of BPM allows management the ability not only to easily identify bottlenecks and inefficiencies in the process, but also to more easily modify the process to improve productivity.

How does BPM fit in with legacy, ERP and other enterprise systems?

One of the strengths of many BPM products is ease of integration with other applications. Many enterprise applications are monolithic, focusing on solving a specific set of problems and making interaction or data sharing with other applications difficult or impossible. This often makes BPM an ideal approach for automating processes that require information from multiple enterprise applications. Facilitating the flow of information among these legacy systems can often provide significant productivity improvements.

Once it became clear that ERP systems were going to be a big piece of the enterprise systems puzzle but not the entire picture, middleware vendors emerged

to help solve some of the vexing system-to-system integration issues. What remained were perhaps the hardest automation challenges of all: processes that changed and/or involved multiple subsystems, external processes and systems beyond your control, and perhaps most challenging—people.

BPM can be thought of as an integration layer that automates processes, includes legacy and other systems, and coaches users through the new process. Just as a typical business process (like introducing a new product) involves multiple functional areas, BPM integrates these areas and the existing systems that support them.

If you have already SOA-enabled your legacy systems, then BPM can move very quickly to address your process problems. If you do not have SOA or a middleware platform, then BPM will typically require custom integration to the necessary systems and data. The need for custom integration is usually not a barrier to BPM, since many modern applications have defined application program interfaces (APIs) or, if not, support direct-to-database integration using SQL.

BPM suites can also be used to build composite

applications—that is, adapt a point solution bought by one department for a specific purpose for use by other departments. BPM acts as an umbrella, defines processes and uses system-integration capabilities without awareness or inconvenience on the user's part. A composite application recombines functionality from a variety of existing sources within an SOA for a new service. Using BPM to build composite applications can provide functionality that would otherwise be too costly or risky to obtain by modifying the existing applications.

What kinds of business processes are typically the best candidates for BPM?

BPM investments can yield a high ROI in these areas:

- Dynamic (not static) processes. Dynamic processes change frequently; static processes seldom change. A good example of dynamic processes are those that must be adapted to regulatory compliance changes—for example, retailers modifying how customer information is managed due to changes in federal privacy law and credit card company mandates.

- Processes that involve people and, typically, cross business unit, division, department, workgroup or other functionally organized groups of people.
- Complex processes (such as an order-to-payment process). Complex processes require the orchestration of a variety of people from different functional departments using different software applications and/or data to do their step in the process.
- Measurable mission-critical processes—that is, improvement to the process would directly improve a performance metric that is measurable and important to the business.
- Processes that cannot be completed without calling on more than one legacy application (or a process that provides significant additional capability, like self-service HR functionality to employees).
- Processes with exceptions that are currently handled manually (for example, a furniture retailer’s reliance on physical discovery and research into inventory aberrances).

- Processes with exceptions that require quick turnarounds.

Areas ill-suited to BPM include:

- Legacy application replacement
- High-volume transaction processing (such as a point-of-sale application, although cross-channel returns might be a good target)
- Processes with little or no user interaction
- Processes that can be simply and cheaply automated with other tools

Sometimes, the most important part of a strategy is knowing what not to do, especially with a fairly horizontal capability like BPM. For a first BPM initiative, the process should be important—but not your most complex or mission-critical. BPM done right is a good example of the flywheel concept: Focus on a specific and quick solution where a visible business process improvement will foster momentum for broader and more sustained BPM implementations.

It seems like everyone is selling BPM; what does the BPM vendor landscape look like?

Vendors present a broad array of solutions designed for many different industries and needs. At a high level, there are two basic camps of vendors: those that offer BPM as part of a legacy collection of products and those that sell only BPM suites (often referred to as “pure play”). Sometimes you can buy BPM solutions in the first category separate from the legacy system, and sometimes you cannot. For example, Filenet P8 (now from IBM) includes process capabilities that are usable only if you use Filenet’s ECM solution, while SAP’s NetWeaver technology can stand alone.

Vendors that offer BPM as part of a legacy collection of products tend to offer BPM capabilities that focus on and extend their legacy architectures. For example, a document imaging vendor will typically offer document-centric BPM capabilities, while a middleware vendor will emphasize the data-integration aspects of its BPM solution. In contrast, BPMS pure-play vendors often highlight their product’s architectural purity, which means it is built from the ground up

to provide integrated BPM functionality. BPM offered with legacy products is often add-ons of technology purchased from another company and then “bolted” on, often making for a fragile solution. Still, both solutions have their advantages and disadvantages.

Open-source BPM solutions also are available, the most well-known is jBoss jBPM.

Some key considerations when evaluating BPM vendors include:

- Verify that the vendor’s BPM platform is truly integrated. Some vendor platforms have built bridges to modeling and simulation tools and call it BPM. Sometimes the reporting component is just an add-on. This “bucket brigade” approach really slows down the iterative nature of a real BPM approach to process improvement.
- Don’t let technology preferences taint an objective comparison of BPMS features and capabilities. Thinking about a BPM tool based on Java versus .NET may be less important than basing one’s decision on the BPM features required by business

analysts for process modeling or the features required by workers to monitor and execute tasks. For example, don’t fall in love with the flashiest rules engine. But don’t get boxed in by your existing architecture or vendor partners when selecting a platform to drive process improvement across your organization. In fact, your BPM platform should be independent of legacy constraints so that you have the flexibility to replace source systems without affecting user-facing process automation.

- Always take a good look under the hood. Different vendors take very different approaches to implementing common BPM features, such as how the process model is linked to lower-level implementations or how a user interface is constructed and integrated into the workflow. Some vendors provide better support for heavy business analyst involvement in constructing a BPM application (which does not require substantial programming expertise), while others require substantial programming expertise for even simple development tasks. Some vendors offer well-defined, easy-to-use APIs to allow for custom in-

tegration to accomplish more unique requirements. Drilling down into the details will help you understand exactly how a particular vendor’s product will fit with the skills and capabilities of your organization and best meet your company’s specific needs.

How is BPM related to service-oriented architecture (SOA)?

An SOA provides access to other applications. BPM uses SOA to include information from those applications into an improved process. If an SOA provides roads to your information, then BPM is the car that leverages that infrastructure to accomplish something useful.

In a nutshell, service-oriented architecture enables services that support business processes to be recombined for greater business agility. In more technical terms, SOA is an integration and architecture framework that supports loosely coupled services and enables interoperability among new and legacy systems. It allows those systems to expose part of their functionality to other applications in a standard way. For example, an accounts payable system could expose an interface to allow other applications to add a debit item. BPM

provides the ability to combine these exposed services from different applications into a new process.

Sometimes BPM initiatives serve as a driver to jump-start an SOA strategy. In a world where business executives are looking for direct value out of their IT investments, SOA by itself can be a hard sell since it can be difficult to explain the value in concrete, understandable terms, and thus makes it difficult to convey its value. One strategy to overcome this is to sell SOA as an enabler of BPM, since BPM is more concrete—it's easy to convey its value in enabling specific (and critical) business processes. By association, SOA does as well.

Still, one of the things to be concerned about is the quality of service that can be supplied by the applications providing the SOA service. This is of special concern when the providers of these services are in other organizations or even other companies. Applications using such interfaces need to be designed to degrade gracefully when those services are unavailable. Management should be sure to develop quality-of-service agreements with their SOA partners. These should include agreements on when and how

interfaces are upgraded. The point to be made here is that if you use SOA as an integration strategy for BPM, you'll end up with critical business processes reliant on those services. If those services fail, then your BPM-managed business process will fail. So be sure you know, or can control, the quality level of any services upon which your BPM solution is based.

Are there any standards being developed for BPM?

Yes, proponents of BPM are attempting to follow the success of other technologies and establish a solid foundation of industry standards that will support continued growth and customer acceptance.

Customers are interested in standards because they may make it easier to move their applications to other BPM vendors, find developers, manage interactions with other BPM systems and external partners, and drive down costs. Unfortunately, the broad capabilities represented by a typical BPMS and myriad interest groups have resulted in standards emerging for only sections of the typical process management lifecycle (that is, design, execute, manage).

Today, the most important standards are:

BPMN (business process modeling notation)—focuses on the graphical modeling of business processes.

BPEL (business process execution language)—focuses on process execution and system-to-system communication.

BPML (business process modeling language)—an XML-based execution language standard based upon Pi-Calculus and Web services.

BPQL (business process query language)—focuses on the administrative and monitoring aspects.

Most notable is that each of these (and the many others not listed) focuses on one small aspect of what is typically addressed by a BPM product. The challenge will be to integrate these standards into a lifecycle of continual process improvement with BPM.

Are there any developed or developing standards that would allow portability of total BPM applications to different vendors?

No, not even close. Standards might allow develop-

ment of some adjunct products (such as reporting and analysis) to make use of some BPM data in the future, but for now, standards are not really playing a significant role (other than marketing) in BPM products.

The more significant standards at this point are those in areas of importance to BPM, such as SOA, XML documentation standards, and so on.

What does BPM cost? What are the hidden costs?

A typical BPM project requires licensing a BPMS from a vendor, training internal staff and hiring outside assistance for your first BPM initiative. Like other software platforms, there are many different types of licenses available: enterprisewide agreements, per processor, per process, per developer, per user, etc.

Now that BPM has gained traction in many large enterprises, BPM vendors are pursuing mid-market companies and reducing license fees to match the budgets of these smaller buyers.

For a typical implementation that leverages a leading BPMS, you should plan for \$250,000 to \$500,000 to address a meaningful process in your organization.

(This cost includes the first two bullets below.)

Potential hidden costs include:

- Having to license and deploy multiple development/test/production environments to support multiple BPM initiatives
- Additional application and database server licenses
- Staff to provide the care and feeding of servers
- Internal cost of direct involvement from business users to participate in process modeling, business rule definition, user interface design, testing and rollout activities
- Change management and training costs associated with convincing users to evolve beyond event-driven to task-driven work (event-driven: workers “know” what tasks to do and in which order because that’s the way they’ve always done it; they prioritize work based on events as they happen; task-driven: the logic built into the BPM solution defines tasks, their order and relative priorities, workers monitor a task list to know what to work on).

What is involved in implementing BPM?

Similar to other software implementations, BPM requires both business and technical resources and activities. Effective BPM is based on an ongoing iterative design/develop/deliver process improvement lifecycle. Although the usual cast of characters will be involved (executive sponsors, project managers, business users, business analysts, technical architects, software engineers, quality assurance and infrastructure specialists), the role they play may be very different with BPM.

In a typical enterprise package implementation, business users are included in up-front planning and requirements definition. After that, they don’t typically get involved in a substantial way until user acceptance testing. BPM implementations, on the other hand, will require constant participation from key business users and analysts as process models are developed and supporting application elements are implemented in an iterative fashion. Many business users and IT staff are not used to an ongoing collaborative approach to implementing software; this makes planning, training and change management key

TAKEN TO TASK

For some organizations, well-planned and executed training is enough to make the transition, but for others, implementing task-driven work processes can require a major cultural transformation.

components in a successful BPM implementation.

Another potential challenge with BPM is the behavioral change required by participants in the process. Often, BPM requires users to move from an event-driven to a task-driven work paradigm (event-driven: using the “squeaky wheel rule”; task-driven: the priorities built into the BPM solution determine tasks’ order).

For many workers, using a BPM application will involve monitoring an inbox of tasks with prescribed priorities and work instructions, rather than concentrating on the task that seems most pressing. For some organizations, well-planned and executed training is enough to make the transition, but for others, implementing task-driven work processes can require a major cultural transformation.

How do companies organize their BPM projects? Who should own a BPM initiative, business or IT?

A typical BPM project includes an executive sponsor, business analysts who have detailed process knowledge, IT staff who can enable the necessary data and systems integration, and developers who build user interfaces that guide users through the new process. Consultants are often used on initial projects, but the goal should be for the organization to be self-sufficient on future BPM initiatives. Often, BPM initiatives require staff from different functional areas of the organization. The project team may resemble a typical IT project, with the exception of increased involvement of business staff in process modeling and user interface design.

BPM often comes into an organization through the IT group. This sometimes makes IT the de facto leader of BPM projects, especially for early BPM efforts. IT’s cross-functional mission also fits well with enterprise BPM capabilities. Many organizations have established internal process improvement teams, and BPM is a natural fit with their cross-functional mission.

However, BPM is an approach to continual process improvement that leverages technology. Ongoing process change requires intimate knowledge of the process and improvement capabilities. In addition, the BPM team has to be empowered to make decisions quickly. These factors make the business owners more suitable to lead and drive BPM initiatives, with facilitation, examples and integration support provided by IT.

How do I build a business case for BPM?

First, you need to analyze the opportunities within your particular organization to determine if BPM will help or just add to the confusion and legacy burden. Remember, BPM is an approach to solving these problems and will likely outlive a particular vendor's platform in your organization.

BPM is most valuable as an enterprise capability; however, it is usually brought into an organization to tackle a specific process pain point. It then spreads in a "viral" nature as internal champions see the initial results and apply BPM to other pain points. For example, HR processes often serve as an entry point for BPM in an organization.

Here are the high-level steps in building a BPM business case:

- Identify candidate pain points/broken processes.
- Pick a few and analyze specific payback into an opportunity chart.
- Build an ROI model.

- Identify revenue growth, cost reduction, compliance and cost-avoidance benefits.
- Identify intangible benefits.

How do I measure and actually get ROI from a BPM project?

Success with BPM is almost always measured with a clear, simple business metric, such as: reduced number of returned shipments, reduced cycle time for special orders, increased dollars recovered from credit disputes, increased consistency of task completion/improved productivity, and reduced time required to onboard new employees.

If you can't identify a metric that is meaningful to your business partners, you need to step back and evaluate if you have identified the right target process for BPM.

The right metrics also help keep the project team focused and the business owners engaged. Since BPM is an iterative approach, keeping everyone in-

involved is crucial to working through the limitations of early releases and actually getting the business to use the solution. Measuring and reporting actual results is required, especially when changing the everyday work habits for business users.

For example, if process exceptions are being posted as tasks on a user portal, management needs to monitor the use and throughput of that portal. If users are not going to the portal often enough, the BPM solution can be modified to deliver tasks to the user's e-mail inbox instead of the portal.

In summary, maximizing your return from BPM requires: Picking the right process targets, assembling the right team, following an iterative methodology, and staying focused on the business goals to drive further improvements and user involvement. •

Patterson is managing partner of BPM Solutions at Athens Group, a consultancy based in Austin, Texas. Cooper is founder of Athens Group.

QUICK STUDY: PREDICTIVE ANALYTICS

Jan Matlis • Computerworld

Definition Predictive analytics is the branch of data mining concerned with forecasting probabilities. The technique uses variables that can be measured to predict the future behavior of a person or other entity. Multiple predictors are combined into a predictive model. In predictive modeling, data is collected to create a statistical model, which is tweaked as additional data becomes available.

➤ Predictive analytics is a set of mathematical techniques applied to a data set for determining the probability that some scenario is likely to happen or be true. These techniques are applied to many research areas, including meteorology, genetics and marketing—areas in which there’s an abundance of data and a need to forecast the future.

In business, predictive analytics are often used to answer questions about customer behavior. For exam-

ple, companies often want to know whether or not a particular customer is likely to be interested in a direct-mail offer. Or a business might want to know whether, given a certain set of premiums and benefits, a new customer will become a long-term customer. Ultimately, businesses want predictive analytics to suggest how to best target resources for maximum return.

Cross-selling, upselling, determining customer profitability and promoting customer loyalty are the best-

known uses of this technology, according to a report by Forrester Research Inc. analyst Lou Agosta (now an independent analyst). But there are many other applications, he notes, including credit scoring, predicting machine failures and making the supply chain more efficient.

Plenty of high-level mathematics are involved, but stated simply, predictive analytics is used to ask which characteristics, called predictors, in a data set are clustered together. The technique is also used to determine whether, given a set of predictors, the value for some other characteristic is likely to fall within a desired range.

Though these two questions sound very similar, in practice, they’re quite different. The first one, the search for clustered characteristics, is like saying, “Look through my database of information and find something about my business that I overlooked or might not already know.” You might look through the history

POWER PLAY GOAL?

A major goal of predictive analytics is to move away from seat-of-the-pants decision-making. But that can run afoul of organizational politics if, say, the brand manager doesn't agree with the conclusions.

of people who have declared bankruptcy to find which characteristics are most tightly linked together: late payments, number of addresses within the past two years, recent divorce or health problems, for example.

The second question, determining whether a particular characteristic falls within a desired range, is like saying, "Given what I know about a customer, find out how likely it is that something else is true." For example, you might want to analyze the characteristics of a person filing an insurance claim to determine the likelihood that the claim is false. The predictors could be how recently he filed his last claim, the dollar amount of that claim or how long the customer has had the policy.

The two approaches work together. Once linked characteristics have been identified, then the second question can be asked. After an insurance company has found which characteristics are most tightly

linked to fraud, for example, it can create an equation that produces a number indicating how likely it is that a particular claim is fraudulent. Suppose an automobile insurance company, AA Acme Insurance, already knows that multiple claims within a three-year period are closely associated with fraud. It could use predictive analytics to quantify the linkage. The result might be the equation:

Possibility of Fraud = 1/Square of (Time Since Last Claim)

In other words, the closer together the claims come, the more likely fraud is occurring. The equation is called a predictive model.

Then suppose that AA Acme fed all the data it collected on its customers into a predictive analytics system that found tightly linked characteristics and learned

that there was another predictor of fraud that it had never imagined. Perhaps the recent purchase of a new home was also linked to automobile insurance fraud. Using this result, it might come up with a new equation:

Possibility of Fraud = 1/Square of (Time Since Last Claim) + 1/(Time Since Last Claim) + 3/(Time Since Last Home Purchase)

This model might catch fraud that would have gone undetected previously.

One key to making models like this work is having plenty of clean data to work with. "Without examples of fraud, the neural network cannot be trained on what to look for," says Agosta. And without historical examples of sales of a new product, a model can't predict a new market opportunity, he says. This is a

case where more data is better, to smooth out idiosyncrasies and reveal information that might otherwise be lost in the noise.

Agosta cites the story of a model that showed senior citizens were buying rap music—not for themselves, but for their grandchildren. If the modeler hadn’t “known that they had grandchildren, then the predictive inference would have been impossible or inaccurate,” he says.

Predictive analytics is full of other challenges, too—from organizational politics to model design, valida-

tion and data preparation. “Data preparation can be up to 80% of the effort of predictive analytics, and many firms are not getting beyond it,” Agosta says.

A major goal of predictive analytics is to move away from seat-of-the-pants decision-making. But that can run afoul of organizational politics if, say, the brand manager doesn’t agree with the conclusions. Models should be revised as needed, but not just because the results don’t support the brand manager’s theory. “Do not second-guess validated test results without

cause and consideration,” Agosta cautions. “Be true to your predictive model.” •

Matlis is a freelance writer in Newtonville, Mass.

The Analytical Payoff

How companies can boost revenue or cut costs with predictive analytics:

Incremental Revenue/Customers:

- Cross-selling
- Upselling
- Customer profitably

Incremental Revenue/Products:

- Market basket analysis
- Pricing markdown
- Product promotion
- Merchandising optimization

Cost Reduction/Customer:

- Customer scoring (e.g., creditworthiness)
- Fraud detection/reduction via profiling
- Customer cost profiling

Cost Reduction/Products:

- Demand planning for inventory reduction
- Supply chain optimization
- Machine/system failure forecasting

Five Best Practices for Predictive Analytics

1. Follow a scientific method:

The process should include hypothesis, testing, implementation and interactive improvement.

2. Perform a readiness assessment:

Build the business case, inventory information assets and enroll key players.

3. Take care of your statisticians.

Data is abundant. Statisticians aren’t.

4. Assemble a cross-functional team:

It should include a business analyst (domain expert), a model builder (statistician) and a data access specialist (database administrator).

5. Prepare clean and consistent data.

USING PREDICTIVE ANALYTICS TO TAP MORE PROFITABLE CUSTOMERS

By **Kim S. Nash** • CIO

Auto loan provider Dealer Services used predictive analytics to find its most profitable customers and avoid the riskiest

»» Dealer Services, a company that lends money to dealerships acquiring used cars, is trying to use predictive analytics to make money when its rivals can't.

The company now studies more complex data than it did in the past in order to better predict which loans will pay off. The "Aha" moment came in 2008, when, as the economy tanked, the private lender began to look beyond simple data points such as loan volume and number of customers. "There was underlying data from dealers that indicated something was brewing," says CIO Chris Brady, including where a new customer had previously gotten loans. If a dealership was coming to Dealer Services because it no longer had a line

of credit at a bank, that was a warning sign of what was happening in the used-car market, she says.

Traditional business intelligence (BI) might point you in a direction, but predictive analytics aims to uncover a treasure map, says David White, a senior research analyst at Aberdeen Group. That's because BI identifies relationships between a few data points, while predictive analytics evaluates how many factors work together. BI vendors are now offering predictive analytics tools that used to be available only from niche vendors such as SAS and SPSS.

White knows of a department store chain using predictive analytics to formulate more profitable cou-

pon campaigns by targeting the right customers. If a store sends a coupon to a customer who was going to make a purchase anyway, the store is no further ahead. But send the same coupon to a shopper who wouldn't have otherwise come in, and you've made money, White says.

Better Decisions

Dealer Services launched in 2005, and it grew so fast that within six months, Brady says, it had met its three-year goals for revenue, number of loans and customers. The company doesn't reveal financial figures, but it now has 70 offices across the United States and serves 11,000 dealerships. It also finances dealers who lease cars and who sell power sports vehicles such as snowmobiles. This growth showed that the market for used-car loans was ripe, Brady says, but

the company needed better BI to understand all that was happening.

Dealer Services originally analyzed data in the same manner as in the rest of the industry, working off basic reports it wrote internally and some Microsoft Excel spreadsheets. Brady says this approach led to some individuals and departments using dif-

ferent numbers for the same reports, which slowed down decision making and hampered forecasting.

Brady brought in Information Builders tools to do real-time analysis of how loans are performing. Managers now study data they hadn't paid much attention to before, she says, such as the age of the loans on used SUVs and trucks. Some dealers were buy-

ing those vehicles at the same pace that they had in flush times, but the vehicles sold more slowly, raising the specter of more loan defaults. That made Dealer Services change how it monitored those dealers, she says. "The number of loans can be big for good reasons or bad," says Brady. "If you don't know the difference, you're in trouble." •

5 TIPS FOR USING PREDICTIVE ANALYTICS SOFTWARE

David F. Carr • CIO

Predictive analytics can help you make better business decisions, but only if you understand its limitations

➤ **It can create new business.** The Navy Federal Credit Union has applied predictive analytics technology from IBM's SPSS unit to the design of new products. Analyzing how ATM withdrawals spiked just before and after a deployment led to the introduction of a checking account with ATM fee rebates for members on active duty. CIO Jerry Hermes says that other business units have since invited the analytics unit into their planning process.

You can't really know the future. Predictive analytics forecasts about your business are useful only as long as you understand that they describe probabilities. "The weatherman gets it wrong some times, even

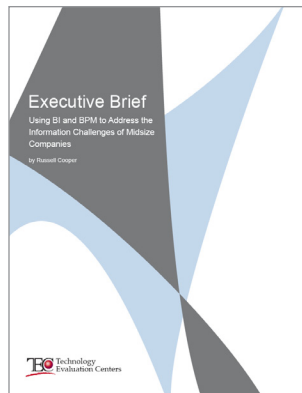
though we've spent hundreds of years collecting data and looking at correlations," says Royce Bell, CEO of Accenture Information Management Services.

Results can mislead. You need to apply business acumen to make sure you draw the right conclusions, Hermes says. Alan Payne, who manages an R&D group at the Navy credit union, remembers when the model seemed to show that more members were deployed than they expected. It turned out that the survey used for the analysis needed to better distinguish between households and individuals; the spouses of deployed members didn't know which box to check.

Watch your gut. People tend to be quickest to accept predictions that match their expectations. These predictions can be valuable when they provide insight into the variables that drive them, Bell says. But lately, C-level executives get most excited "by the nonintuitive ah-ha," Bell adds. Results that prove the limits of intuition are a "tough but valuable sell," because employees often resist conclusions that go against their experience and instincts.

Garbage in, garbage out. "A good number of analytic programs fail on questions about the veracity of data," Bell says, so getting serious about data quality is one of the prerequisites for success. That may mean you have to be selective about the data you feed into your model, he adds. Less is more when you focus on the most accurate information and leave out questionable numbers. •

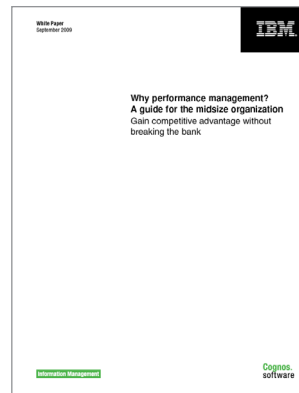
BUSINESS INTELLIGENCE RESOURCES



Overcome the challenges of growth with business intelligence and business performance management.

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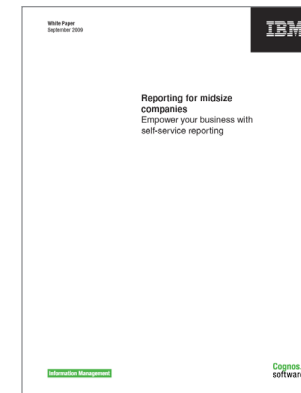
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