How to set up and manage a successful business analytics program

Learn what you need to know to organize, structure and manage a successful business analytics program that will give your organization more insight into its data than conventional reporting-based business intelligence can provide. This E-Book includes how-to advice on creating an analytics culture, setting up an analytics team and preparing for an installation of analytics software. In addition, get tips and strategies for building up an organization’s analytics skill set and supporting analytics professionals.

IT, business intelligence and analytics professionals will get guidance on:

- Creating an analytics-oriented culture within an organization, including an overview of the importance of a top-down emphasis on fact-based decision making.

- Acquiring the required analytics skills, with tips on the types of specialized workers that are needed, how to find them and how much they’re likely to cost.

- Structuring an analytics team and supporting data analysts after an installation of analytics software, including advice on where analytics teams should be placed within an organization and whether they should have control over the tools and data they use.

- Getting corporate data ready to support an analytics program through data quality, data integration and data governance efforts.

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Creating an advanced data analytics business culture: Tips and advice

By Craig Stedman, Site Editor, and Mark Brunelli, News Editor

The quickest, and potentially most successful, way to create an internal business culture that thrives on advanced data analytics technology and fact-based decision making is to start at the top of an organization, according to some IT professionals and industry analysts.

Just ask Bill Robinette, manager of business intelligence (BI) systems at Advance Auto Parts, a Roanoke, Va.-based retailer with about $5 billion in annual revenue. Two years ago, Robinette bore witness to the fact that a change in senior management can clear the way for the development of a data analytics business culture and a data warehousing, BI and advanced analytics program.

At a recent event held in Cambridge, Mass., by The Data Warehousing Institute (TDWI), Robinette said that when he joined Advance in 2006, business decisions were typically based on data stored in spreadsheets and Excel-generated cubes.

“Basically, we were running the business on gut feel,” he said, adding that more sophisticated BI and analytics investments were a tough sell because company higher-ups were mainly focused on redesigning Advance’s retail stores.

Going from ‘gut feel’ to an analytics business culture
Things changed in early 2008, when a former Best Buy executive took over as Advance’s CEO and put a priority on improving the mix of parts in different stores based on local demand. Instead of the previous one-size-fits-all approach to merchandise planning, the company now uses data mining and predictive analytics tools to help automatically set plans for populating individual stores with parts, Robinette said.
In addition, an analytics business culture has been firmly established within the retailer, he said: “My big cultural challenge now is that I have people who want [analytics] and I can’t deliver it fast enough.”

Operational improvements enabled by the analytics tools have helped to solidify the software’s place in the company. For example, in the past, about 20% of the parts stocked in stores didn’t sell within a year. Advance has used analytics to lower that figure to 4%—a reduction that is “worth millions of dollars to our bottom line,” Robinette said. The company also uses performance metrics generated via its analytics applications to set growth targets for store managers and foster internal competition among stores.

Analysts say that Advance’s experience with analytics technology is becoming more common these days: A technology-savvy CEO, often someone brought in to replace the previous top executive, pushes a company to use advanced data analytics software and methodologies to generate deep data insights that can support better business decisions.

To help an analytics initiative succeed, senior executives need to drive an internal emphasis on optimizing business performance through quantitative measurements, TDWI analyst Wayne Eckerson said. They also have to put the company’s money where their mouths are by funding and prioritizing analytics projects, he added.

**Analytics software doesn’t equal an analytics business culture**

But new analytics software and high-level executive support—while a good start—aren’t enough to foster and maintain an analytics business culture. Companies also need to make sure that their employees have the ability to make the right decisions based on information gleaned from analytics technology, said Dan Vesset, an analyst at Framingham, Mass.-based IDC.

“I think that was part of the problem, for instance, with the financial crisis,” Vesset said. “The systems correctly identified risks, but the humans overrode those signals because they were incented to do so.”
A recent IDC survey of 1,100 organizations found that analytics programs tend to work best when employees are truly willing to let their actions be influenced by the technology. The survey also found that companies with successful analytics programs tend to be more successful in general. “The more analytically oriented a company was, the more competitive they were in their industry,” Vesset said.

He added that education and training are two of the keys to creating a long-lasting data analytics business culture. But that means more than simply teaching employees how to press buttons, click icons and read data on executive dashboards, he cautioned. “We don’t just mean training on the tools but also training on analytics techniques,” Vesset said. “There is a lack of people who are knowledgeable on the different ways of analyzing data.”

Employees should also be educated about the meaning of data as it pertains to their company’s specific key performance indicators and performance metrics, he advised, while noting that such training is currently lacking at most companies.

Using an analytics group to help create an analytics business culture

Another potential way to help foster an analytics business culture within an organization is to set up a dedicated data analytics group, according to Eckerson, who put cultural issues at the top of a list of analytics challenges during a presentation at the TDWI event in Cambridge.

While most companies haven’t gone that far yet, he said, an analytics group with its own director could develop an analytics strategy and project plan, promote the use of analytics within the company, train data analysts on analytics tools and concepts, and work with the IT, BI and data warehousing teams on deployment projects.

One more point to keep in mind: Don’t go overboard on the use of analytics tools. For example, Advance Auto Parts tied information gleaned from analytics software into a performance dashboard application that was rolled out last year. The dashboard gives store employees a quick view of key performance metrics—a capability that Robinette said
reinforces the importance and value of analytics without requiring front-line workers to delve deeply into it themselves.

“We didn’t want to turn our store managers and associates into data analysts,” he said. “We want them out front in the stores, selling products.”
Analytics skills in demand—and analytics pros demanding top salaries

By Jeff Kelly, News Editor

Looking to hire top-notch data modelers, predictive analysts and other advanced data analytics professionals to beef up your organization’s analytics skills? Better get your checkbook ready.

As more and more companies deploy predictive analytics tools and other data analytics software and begin filling the ranks of their analytics team, the pool of available talent is shrinking and hiring costs are growing, according to industry analysts and executives at companies that are in the market for analytics skills.

“Workers that have this kind of knowledge are in high demand,” said Leslie Ament, an analyst at Hypatia Research LLC, a Lexington, Mass.-based research and consulting firm that specializes in customer data analytics.

As head of strategic risk analysis at New York-based insurance firm Chartis Inc., John Savage knows firsthand the cost of hiring—and keeping—first-class advanced analytics pros. Savage is looking to grow his seven-person analytics team, and he has no illusions about what it will take. “We are currently looking for a pretty senior person, and we know that it’s going to cost us,” he said.

But paying top dollar is worthwhile, Savage said, noting that his group has had zero turnover since 2004. According to Savage, that has allowed his analytics staff to build a good working rapport and achieve better and better results—thus helping to justify the high labor costs. “I don’t want anyone on my team being undercompensated,” he said. “We try to pay for value.”

Forrester Research Inc. analyst James Kobielus said it’s understandable that advanced analytics pros are in high demand. He noted that with traditional business intelligence (BI) reporting and query tools achieving mainstream adoption, a growing number of companies
are looking to predictive analytics, data mining, text analytics and other analytics techniques to gain the next competitive edge.

But analytics has been primarily the domain of statisticians, quantitative analysts and other highly skilled workers. And with demand from employers rising, those coveted few who possess advanced analytics skills are being amply rewarded.

North Carolina State University’s advanced analytics master’s degree program offers a glimpse into the competitive world of analytics staffing. According to Dr. Michael Rappa, director of the school’s Institute for Advanced Analytics, 38 of the 39 students who completed the program in May got at least one job offer within 90 days—and many had multiple offers in hand before they even graduated.

Overall, the average number of job offers per student was 2.3, with 30% receiving three or more offers, Rappa said. And the positions offered—ranging from business analyst to director of quantitative analytics—pay what graduates of MBA programs are used to getting. The average salary offered to this year’s graduates, according to Rappa, was $94,000, including signing bonuses.

Different options for finding data analytics skills, staffing

Until recently, companies looking to establish a data analytics program had essentially two options on staffing if they had trouble hiring people with analytics skills. One was to outsource the job to third-party analytics providers such as Mu Sigma and Apollo Data Technologies.

IDC analyst Dan Vesset said the third-party firms have deep analytics skills and experience, meaning companies that use their services don’t have to invest time and money in hiring, training and organizing their own analytics teams.

The downside is that using a third-party analytics specialist requires companies to give up control of their corporate data, a step that many organizations are unwilling to take. Outsourcing can also get expensive, depending on the scope of an analytics project. And
there is the potential for a clash of cultures as the outsourcer tries to fit its analytics processes to the customer’s business model.

The other option was to cultivate analytics professionals from within. Most of the large vendors peddling advanced analytics technologies—IBM and SAS Institute, for example—offer training and consulting services to get internal staffers up to speed on their software. But that approach sometimes requires a significant investment in analytics tools upfront, often before the particulars of a data analytics program have been fleshed out.

In addition, advanced analytics pros need both technical and business skills, a set of abilities that takes time—and the right aptitude—to develop.

**Analytics skills program ‘trying to produce that different kind of person’**

A third option is emerging, however: A number of universities, such as North Carolina State, have established degree programs in advanced analytics. While their graduates won’t completely fill the talent pool, they could offer another alternative to companies looking for skilled, if not experienced, analytics workers.

Rappa, who is also a computer science professor at North Carolina State, established the master’s of science in analytics program there in 2008. As he saw it, students graduating with traditional statistics and computer science degrees didn’t have all the skills that employers were looking for in an analytics pro – a belief that was backed up by feedback from companies that had hired recent college graduates.

The master’s program aims to counter those deficiencies with a curriculum that draws on a number of disciplines, including statistics, computer science and business training. “The skill set that’s needed in this evolving world [of analytics] doesn’t sit neatly in a box,” Rappa said. “We’re trying to produce that different kind of person.”

And by the looks of it, many large, household-name companies are seeking the kind of person that N.C. State is producing. The businesses that have made job offers to the analytics program’s graduates over the past three years include Bank of America, Capital
One and Amazon.com. Some of the leading analytics vendors have also made offers to graduates of the program, Rappa said.

**Recipe for success: A mix of advanced analytics skills and talent**

Forrester’s Kobielus said some of the more successful analytics teams he has come across are staffed with MBA-educated marketing experts who work hand-in-hand with statistical modelers. Business knowledge tends to rub off on the statistical “math gurus,” while the MBAs gradually pick up technical skills—helping to make the teams more cohesive and effective, he said.

Royal Bank of Canada has taken that tack in its quest to build an advanced analytics practice. The bank set up a data analytics team that supports the marketing department, helping it to better target marketing campaigns and find new revenue opportunities.

"We’ve got some Ph.D.s and some graduate degrees in statistics, and then some business analysts that have learned along the way and know the technology," said Cathy Burrows, director of marketing services at the Toronto-based bank. "It’s important to have a mix."

At Chartis, the analytics team includes not just a mix of workers from different backgrounds but also people with distinct skills, Savage said. Three of the seven staff members are specialists in data modeling and statistical analysis. Two are tasked with testing and maintaining the analytical data models. And the other two concentrate on communicating the analytics results to end users via reports and other techniques.
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Data analytics team’s needs: a business home, leeway on tools and data

By Jeff Kelly, News Editor

If finding and hiring talented workers with analytics skills is the first step in establishing an advanced data analytics team, determining how to structure it in relation to your IT and business intelligence (BI) groups—and how much autonomy to give your analytics professionals—is step two.

Some companies, especially those with highly centralized corporate structures, may be tempted to place an analytics team under the purview of the IT department or a standalone BI unit such as a business intelligence competency center (BICC). But according to analytics experts, most successful analytics initiatives take a more decentralized approach.

Data analytics teams are usually organized by business function or placed directly within a business unit, said James Kobielus, an analyst at Forrester Research Inc. For example, an analytics team that focuses on customer churn and other marketing-related analysis might be part of the marketing department. Risk-focused data analysts are typically best suited to the finance department, Kobielus said.

That’s because developing, testing and maintaining complex analytical data models involves significant domain-specific business knowledge, a requirement that doesn’t lend itself to a centrally controlled analytics program, according to Kobielus. He noted that statisticians, quantitative analysts and other analytics professionals dig deep into targeted, often-thorny business problems.

Many data analysts “are artisans taking pride in their work and [are] not all that eager to give up that autonomy,” Kobielus said.

Jeff Jackovich, managing partner at Visibility Resource Group, a Boise, Idaho-based staffing agency that specializes in recruiting and placing SAS data analysts, said most of the companies he deals with are looking for analytics professionals with expertise in a particular business area.
For example, a large retailer with more than 1,000 stores has hired Jackovich to find merchandising analysts who can help determine how best to stock the company’s store shelves. “Most analytics teams are in specific departments” and are not housed under an umbrella BI or IT group, Jackovich said.

**Maintain communication between data analytics team, BI staff**

That’s not to say that advanced data analytics teams should be completely cut off from their BI and IT cousins, however.

At Royal Bank of Canada, the BI team and a pair of advanced analytics teams that RBC has set up are “close, but they’re not side by side,” said Cathy Burrows, the Toronto-based bank’s director of marketing services. “They don't report into the same executive.”

Burrows said that for the most part, RBC’s analytics teams are organized by the departments they support. Marketing data analysts focus strictly on marketing analytics, for example, while the risk management analytics team concerns itself strictly with that function.

But the two data analytics teams work with each other, and with the bank’s BI staff, to share best practices when applicable, Burrows said. For example, if marketing analysts create a data model that could also be useful for risk analysis, they might pass it on to the risk management analytics team. “They have to be able to communicate,” she said.

**Analytics team preferences: choosing, experimenting with analytics tools**

Another impediment to a centrally controlled data analytics structure is the variety of analytics tools that are available—and a desire on the part of data analysts to choose the ones they use themselves. While organizations with an advanced analytics program tend to have a default analytics software provider, many analysts have their own preferred tools and like to experiment with cutting-edge technologies, including open source data analytics tools.
And that experimentation should be encouraged, Kobielus said. He noted that the analytics software market is hardly commoditized, with different tools possessing different strengths. His advice: Data analysts should be allowed, within reason, to use the tools that they find to be best suited for the job at hand.

“There might be lots of circumstances why you don’t shove a particular tool down everybody’s throats,” Kobielus said. “There’s something to be said for letting a thousand flowers bloom.”

John Savage, head of strategic risk analysis at New York-based insurance firm Chartis Inc., said his team has largely standardized on SAS Institute’s analytics applications. But from time to time, members of the analytics team also use various tools based on open source scripting languages.

For example, the team tried out some Java-based tools when it was looking to build fraud-detection data models. “As a group, we experiment with different technologies,” Savage said.

**Letting the data analytics team play in ‘data sandboxes’**

In addition, Savage gives his analysts a good deal of autonomy to play around in their own data sandboxes of sorts. While the analysts can’t experiment on live production data per se, they can copy it to their desktop systems and test analytical models and scenarios with client-based SAS apps, he said.

Bill Robinette, manager of business intelligence systems at Advance Auto Parts, is also looking at the data sandbox approach as a way to give analytics users at the Roanoke, Va.-based retailer more control over the data they need to look at. “We’re trying to figure out how to create that,” Robinette said after speaking at a recent event held in Cambridge, Mass., by The Data Warehousing Institute.

Part of the interest in sandboxes stems from data analysts asking for the ability to pull information out of Advance’s data warehouse for their own use. Letting them load data into segregated sections of the warehouse would be more secure, Robinette said. He added,
though, that there are some hurdles to get over—for example, analysts setting up their own sandboxes “would have to be somewhat savvy with SQL to know how to combine data and do what they want to do.”

As a stop-gap measure, Robinette has given some analysts in Advance’s merchandising and marketing groups access to transaction-level data stored in the data warehouse. That at least lets them run queries against more detailed data than typically would be available to them, he said.

Robinette is also OK with data analysts using different analytics tools. IBM’s SPSS software is Advance’s standard analytics technology, but some analysts prefer SAS apps—and Excel use “is almost a given,” he said. “In analytics, I think it’s important to let people use tools they’re comfortable with.”

Still, an analytics team should occasionally evaluate the tools it is using and consider dropping those that have outlived their usefulness, Kobielus advised. “Look for opportunities,” he said, “to prune the predictive modeling tool bush.”

Site Editor Craig Stedman contributed to this article.
Getting ready for an advanced business analytics software project

By Mark Brunelli, News Editor

Companies looking to take advantage of business analytics software should first make sure that their data house is in order, according to industry analysts and other experts on analytics technology.

The first step in any analytics project is to get company data cleansed and profiled so that it can be made available for use by statisticians and other data analysts, according to Dr. Fern Halper, a partner at Hurwitz & Associates, a Needham, Mass.-based consulting and research firm that focuses on emerging software technologies.

“Data quality is always the most important thing, because ‘garbage in, garbage out,’” Halper said. “That is something people have to understand.”

She added that one of the biggest data quality issues affecting organizations with business analytics software initiatives involves joining disparate data sources that may contain inconsistent information.

For example, a customer might be listed as “Customer A” in one data source, but the same listing in a different data source might be for its parent company. And perhaps “Customer A” in yet another data source could be a different company entirely. Without proper data cleansing and profiling, Halper said, the customer revenue totals calculated for the first customer would be way off, and analytical models incorporating the information would produce faulty results.

Wayne Eckerson, an analyst at The Data Warehousing Institute (TDWI), noted that data analytics projects can pose even more data quality challenges than conventional business intelligence (BI) deployments because of the ability of business analytics software to examine large data sets in an effort to detect hidden patterns and trends.
Eckerson cited data quality as one of the top-four analytics challenges during a presentation at a recent TDWI event in Cambridge, Mass. He recommended that IT and BI teams working on the projects consolidate detailed data in a single data warehouse, then integrate, normalize and cleanse the information and standardize its underlying metadata before providing access to data analysts.

**Overcoming the challenges of advanced business analytics software tools**

Many enterprises are also becoming more interested in advanced analytics technologies, such as predictive analytics software and tools that enable users to analyze voicemail messages, videos and unstructured text found in call center reports and corporate documents and on social media websites.

But the use of those tools requires careful preparation. For example, voice, video and text analytics technologies come with their own set of challenges to overcome, according to Thomas Davenport, co-author of the new book Analytics at Work and a professor of information technology and management at Babson College in Wellesley, Mass.

Typically, the biggest problem that companies face when deploying unstructured data analysis tools is the fact that words can often have multiple meanings, Davenport said. And being able to discern what a specific word means in a particular usage requires business analytics software and systems to exhibit a human-like understanding of context and inflection.

For example, in a warranty report or on an invoice, the “buyer” could be an individual consumer, a worker within an organization’s purchasing department or perhaps the organization itself. Davenport said making sure that an analytics system can recognize and differentiate among the types of customers in those different scenarios may require some serious technical expertise and development work.

One of the best ways to ensure the success of an advanced analytics programs is to hire smart people with varying forms of expertise. Davenport said that most organizations will
need some “hardcore analytical professionals”—people who tend to have a Ph.D. or other advanced degree in statistics, mathematics or quantitative analysis.

Halper agreed. The people who build analytical data models for an organization need “to be really attuned to understanding the ins and outs of data analysis,” she said. “It requires a deep understanding of your data and a certain thought process.”

**Data gaps can hinder business analytics software**

One of the toughest parts of large-scale analytics programs is integrating data from various departments and supply-chain partners, said Dr. Richard Hackathorn, founder of Bolder Technology Inc., a Boulder, Colo.-based consultancy specializing in analytics, BI and data warehousing.

Hackathorn has been working with a large high-tech manufacturer that recently completed a data warehousing project designed to combine information from its entire distribution network for BI and analytics purposes. As a result, the company can now track a product’s origins no matter how long ago it came off the assembly line, Hackathorn said.

“One [thing] they said to me that really stuck is that the real opportunities for improvements are in the cracks—the cracks between functional units,” he noted. “It’s the cross-functional things that really trip you up.”

For example, a manufacturing process may consist of more than 200 individual steps involving different departments within a company as well as external suppliers. “One department may be really doing their job well and taking their responsibilities seriously, and another department is doing likewise,” Hackathorn said. “But it’s the handoffs between the departments where things can go awry.”

That in turn can lead to data problems that may wreak havoc with analytics results. According to Hackathorn and other analysts, one way to overcome cross-functional data issues is to create a unified data management and data governance program with detailed rules related to the handling of data by different departments. The data governance policies
should be designed to help ensure that gaps don’t arise in data collection, management and use.

The increasing interest in using in-database analytics software, particularly within large organizations, could make it easier to keep tight control over data and data governance practices, Davenport said. In-database analytics allows users to run data analysis applications within a database or data warehouse, also potentially yielding reduced costs and faster development as well as the ability to embed predictive models in business processes and applications more easily.

But don’t expect the data-related problems created by business analytics software deployments to disappear anytime soon.

“There are always issues around data quality, data governance and data integration across large organizations,” Davenport said. “That never goes away.”

Site Editor Craig Stedman contributed to this article.
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