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# BUSINESS INTELLIGENCE SHOWS ITS SMARTS

New platforms and business-user tools are helping to defray the consequences of a less than robust economy.

## Executive Summary

Business intelligence is information that drives organizations. Through technologies that capture, organize, stage, access and analyze data, BI gives companies the insight to make better strategic, tactical and operational decisions.

Traditionally, BI platforms have provided entities with the ability to capture data in reports or dashboards on a past moment in their operational cycle. They then review, model and manipulate the data against specific key performance indicators (KPIs), deciding what actions, if any, to take. Legacy BI demands heavy IT involvement and doesn't prescribe a course action.

Next-generation BI isn't your father's BI. It's a new way of thinking about data. Self-service capabilities and advanced analytics tools and applications are making BI platforms and tools user-friendly, dynamic and predictive.

The objective is to generate actionable insights, more quickly, from growing volumes of internal and external data, in order to make better business decisions. Such actionable insights could be related to supply and demand chains, competitive market advantage or internal organizational performance.

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## Table of Contents

2 Business Intelligence Defined

3 Get Smart: Why You Need BI

5 BI Benefits

5 Don't Set Yourself Up for Failure

6 Must-Have BI Platform Characteristics

8 CDW: A Business Intelligence Partner That Gets IT

# Business Intelligence Defined

The definition of business intelligence is an always-moving target. BI is simultaneously a guidance system, business driver, competitive differentiator and a set of technologies for capturing, organizing, staging, accessing and analyzing data — and making it actionable. It gives organizations the insight they need to make better strategic, tactical and operational decisions.

Big Data's explosion combined with the arrival of hot startups and retooled and new offerings from established companies — including some tech industry giants — are again redefining BI. In some cases, the term "business intelligence" has given way to newer, sexier terminology.

One reason for the shifting nomenclature is general disillusionment with legacy BI. This shift has encouraged vendors, market analysts and influencers to test terminology that they believe better reflects current needs and better positions, amped-up technologies and capabilities.

Over time, BI has become synonymous with reporting, which captures data from a moment in time — the previous quarter, week or day — and presents it in reports and dashboards. With these tools, users can analyze performance against their specific KPIs to decide what actions they should take.

However, the complexities of Structured Query Language (SQL) prevent most business users from running their own queries and reports. This likely requires IT involvement that slows the time between report requests and delivery.

Legacy BI's reputation particularly suffered when it only provided select individuals with reports based on data extracted primarily from complex back-office systems, such as enterprise resource planning or ERP, thereby restricting its ability to improve enterprisewide performance.

"Classic BI was never designed to do much more than inform a single individual," says Neil Raden, CEO and principal analyst at Hired Brains. "The analyst maybe generated a report that was published for a wider enterprise audience to review. However, traditional BI was really geared toward informing one person."

Even now, just 20 percent of employees in organizations that have deployed BI tools have access to them, according to a 2012 study by Dresner Advisory Services — and many of those with access to BI tools don't use them. According to Gartner, only 28 percent of the potential users of standard BI tools take advantage of them. And there are numerous subject areas such as HR, marketing, social media and so on that have yet to start BI and analytics.

The reason? Many individuals find them difficult to use or their content of limited relevance. That's why so many business analysts prefer to plug report data into Excel spreadsheets for the purpose of modeling and analysis.

Still, BI has come a long way in recent years. Newer BI tools can be used throughout the enterprise, from the C-suite to the shop floor. Gone are the days when only the most rigid systems, which don't readily surrender data for analysis, were the focus of queries and reports.

Today, organizations of all sizes are applying BI to a range of business issues. They're tapping into systems and applications across the enterprise, as well as new functionality and computing capabilities that simplify data access and analysis and reduce IT intervention.

## BI Versus Business Analytics

Industry continues to engage in a heated debate that pits business intelligence against business analytics. Technology providers, analysts and influencers differ in their terminology and positioning of BI and analytics.

Some take everything related to decision support — data warehousing, analytics, business discovery, performance and information management, master data management — and call it "business intelligence." At the same time, others call it "business analytics." Still others use the terms interchangeably.

To simplify the conversation, many experts position business analytics as a critical component of an advanced business intelligence platform. It is one designed to enable a range of users to retrieve relevant data and transform it into actionable insight for improving operations, performance and innovation.

Advanced analytics tools, as well as industry- and process-specific analytics applications, have made BI actionable. New BI platforms provide data mining, modeling, and statistical and predictive analysis and align with business processes for

### Technologies for Enabling Business Intelligence (BI)

- Applications and data sources
  - Customer relationship management (CRM)
  - Supply chain management
  - Vendors: IBM, Microsoft, Oracle, SAP, SAS
- Data integration
  - Middleware
- Data exchange
  - Data warehouses
  - Relational databases
- Storage and computing hardware
  - Storage area networks (SANs)
  - Network-attached storage (NAS)
  - Hierarchical storage management
  - Tape libraries
  - Vendors: EMC, NetApp

granular insight. They also include user-friendly features and functionality that appeal to a growing segment of employees.

Ultimately, BI, both as a competitive differentiator and a set of technologies, is an indispensable asset for transforming raw organizational data into actionable insight. CIOs seem to think so — they named "BI and analytics" as their top technology priority in both 2012 and 2013 in Gartner's annual CIO survey.

## Get Smart: Why You Need BI

BI is a market on the move and on a mission: to shed its decades-old image as a means of reporting on historical events, and instead wants to be seen as a dynamic segment that delivers actionable results for on-the-fly decisions.

Supporting this mission are BI platforms featuring a svelte, integrated infrastructure; Big Data management; advanced analytics tools; packaged analytics applications; query and reporting tools with user-friendly interfaces; and far-faster data processing capabilities.

It's destined to play a starring role in the realization of the "real-time enterprise." BI technologies today are designed to be part of seamless workflows that allow employees to access data stored in a variety of formats; make informed, actionable decisions; and link into operational systems to carry out those actions. Instrumental to this new enterprise model are such technological advances as in-memory computing and data virtualization.

The objective of emerging real-time enterprise strategies is operational excellence. Getting there requires that organizations wade through large quantities of data and conduct analysis via in-memory processing, where the source database in queried only once thereby eliminating repetitive processing and the burden on database servers.

"With today's technologies, you can do very complex analysis at a speed that is orders of magnitude faster than traditional methods," says Joshua Greenbaum, principal at Enterprise Applications Consulting (EAC). "You can be much more responsive and proactive in meeting your raw analytical requirements, as well as do more predictive analysis by performing very complex data modeling. Organizations need these capabilities to compete in an increasingly complex world."

Public and private sector organizations alike have their hands full trying to measure their performance against their own KPIs. Meanwhile, they have to understand numerous external factors, such as market sector activity, competitors, their comparative performance, the economic climate, regulatory guidelines and the political environment.

### Mass Data: Volume, Velocity, Variety

Meanwhile, most organizations are also simultaneously struggling to manage the Big Data phenomenon. The "3 V's" — a term coined by analysts to describe the high-volume, high-velocity and high-variety nature of Big Data — have exponentially magnified the BI challenge. Not only is there more data to manage, but more nontraditional data, whether it's unstructured text from comments and social media streams or semi-structured data from log files and clickstreams.

"Big Data is having an impact that business can't ignore," says Dan Vesset, vice president for business analytics at IDC. "Everyone's watching Google, Wal-Mart and eBay because they're able to do what they do thanks to analytics. That's putting analytics on every executive's mind, and they're at least exploring options, if not already in deployment."

Dresner's research shows that executives have been increasingly driving BI initiatives over the past three years, a shift from five years ago when IT was the dominant force. Though IT spearheaded 45 percent of BI initiatives in 2012, Dresner's survey shows that BI budgets are shifting away from the technology team and toward business departments.

Experts believe IT's role will shift accordingly: It will be less involved in BI tool selection and report creation and more focused on infrastructure management and governance.

### Dependence on IT Slows Process

In fact, one of the big knocks on classic BI is that departments needing reports have to rely too heavily on IT. Running report queries against source data impacts transactional database performance, so IT workers have to use extraction, transformation and loading (ETL) tools to pull application and systems data and put it into a data warehouse optimized for query response.

Depending on a user's data interactivity and usage requirements, IT may have to create an additional user-optimized data mart. These tasks consume a significant slice of IT resources and slow the production of reports users need to conduct analyses.

Further, IT workers initiate these processes based on report requests; they can't anticipate every enterprise intelligence need. For ongoing intelligence requirements, they can build predefined reports aligned with the organization's KPIs, but for ad-hoc reporting, they're required to create and optimize data warehouses.

Though large companies and organizations have dedicated database administrators, data architects and data engineers, smaller ones usually must rely on their general IT staff unless they can afford to outsource BI services. A downed network or security breach takes precedence over report requests, further extending the wait time for users who need to review and analyze data.

### Doing It for Themselves

Even with a growing number of departments using self-service BI tools, IT staff won't be free of BI tasks. Organizations require people with the expertise to build warehouses and marts, collaborate on tool selection and help end users —

even power users — learn how to get the most bang from self-service functionality.

The self-service query and reporting tools market is focusing efforts on simplifying the data access process and developing more user-friendly interfaces and features. This is to allow organizations to push the tasks of running ad-hoc queries and reports to a broader user base.

After all, one of the business objectives of BI is to empower end-users with the right tools. This way, they can extract and leverage insights in near real-time without having to depend on centralized/IT resources.

"Newer tools are more visual and user-friendly, which makes them more suitable for self-service," IDC's Vesset says. "They provide drag-and-drop functionality, visualization features and display text in understandable language, not IT terminology."

These tools let users point directly to a data source — whether it's a data warehouse, mart, spreadsheet or flat file — load everything into an in-memory engine and easily build interactive visualizations and dashboards. "That's light-years ahead of what legacy BI provided," Hired Brains' Raden says.

The volume of nontraditional data flowing into organizations is redefining the kind of analytics tools they need, as well as the database structures. "There are analytic techniques optimized for different data types, so if you want to squeeze all the potential or performance from your systems, you need different types of tools," Vesset says. Twitter feeds, for instance, have to be analyzed using both statistical and linguistic methods.

Further, different data types dictate whether IT deploys relational databases, graph databases, NoSQL (not only SQL) databases, Apache Hadoop clusters or other structures.

Different usage needs likewise impact database structure decisions. C-suite executives might want formal reports on a quarterly basis, while departmental managers concerned with customer behavior might need access to real-time data so they can adjust operations on the fly.

The message? Build BI capabilities with self-service BI tools that empower end users to explore data on their own terms – while ensuring the overall security of the data.

## Point of Analysis — Close to Targeted Processes

Another drawback of legacy BI platforms and the traditional supporting infrastructure is that they tend to result in departmental data silos. They, therefore, don't facilitate cross-departmental data analysis for decisions that require multiple inputs.

Repurposing data from legacy "stove-pipe" data silos can be a challenge. However, it can enable the enterprise to reduce costs, drive innovation and streamline ongoing business operations.

Significant operational improvements come only when organizations shift the point of analysis closer to a process. This provides real-time insight into the entire process, reduces lag between analysis and action, and informs process adjustments. Those departments that use actionable tools to inform decisions also trust that the actions they take will address process exceptions.

## Unlock Data — Then Lock It Down

Not surprisingly, new BI capabilities and corresponding levels of data access bring new IT concerns. Security risks rise as more users access more data from more platforms, particularly mobile devices.

IT should reengineer classic BI policies, procedures and practices to reflect the paradigms of pervasive BI and mobility. Smart IT leaders institute strict security protocols, access controls and monitoring practices. If employees use mobile

### BI at Work in Business

Companies from all industries use BI across lines of business and departments. Thanks to streamlined infrastructures and new tools, businesses can apply BI to nearly any system, application and process and get actionable results to improve operations.

Take customer relationship management (CRM) — specifically, customer support. As a growing competitive differentiator, this support function needs analytics to evaluate customer behavior, segmentation, churn, retention, demand, engagement and satisfaction.

With discovery and analytics tools and service-specific analytics apps, support managers can slice large quantities of customer support data at high levels of granularity. They can, for example, model scenarios based on a specific product relative to a customer segment and its direct-services reseller channels to analyze financial metrics.

If the product development team is rolling out a new high-profile offering, support operations managers can model technical support staffing scenarios to discover the best worker skills for the product type. They can also find the right spread of support specialists across shifts based on customer locations worldwide, the best escalation processes and the necessary support tiers.

Based on the actionable intelligence they gain, managers can staff support operations in advance of the product release date. Because the provider's success depends to a great extent on customer satisfaction, its ability to model the best combination of support talent for each shift and region upfront — as well as quickly adjust post-launch should parameters change — delivers significant competitive advantage.

BI applications, IT must have the ability to remotely monitor devices and wipe all data if it's lost or stolen or if login attempts exceed thresholds.

Security concerns aside, mobility has unleashed an entirely new level of productivity for BI application users. Thanks to the self-service trend, in-memory computing, and BI and analytics in the cloud, organizations are pushing data out to a large number of users, many of them using mobile devices. Two key factors are at play with mobile BI: There's the anytime, anywhere aspect as well as the touch-based experience.

"The touch experience is huge in the BI world," EAC's Greenbaum says. "It's providing users a much more intuitive experience; users are essentially getting their fingers into their data." Further, the popularity of mobile tablets and emergence of C-level analytics has captured C-suite executives. "CEOs can be on the move and look at their KPIs on their iPad and, in theory, run their business," he says.

## BI Benefits

The new class of BI technologies includes operational and tactical analytics that improve operational efficiency in real time. Supply chain management is one function ripe for both operational and strategic optimization.

With petabytes of data on their customer demand, market conditions, logistics network and supply chain, C-suite executives can use next-generation BI to refine strategies and plan ahead. Meanwhile, factory floor managers armed with operational analytics tools can have an immediate and profound impact by moving the point of analysis close to manufacturing resource planning (MRP) processes.

A traditional MRP report requires running a batch job overnight; managers planning the next day's production have to wait until the following day to see what they need to produce. "What if they could do an MRP run that previously took eight hours in a minute? They could model several MRP scenarios to determine which one is best, plan their production, and make the change in the operational systems before they go home," Greenbaum says.

### Smarter Decisions for Competitive Advantage

See an opportunity that could take the organization to a new level and raise the bar for competitors? Arm skilled users with discovery and analytics tools and packaged applications designed for their function, and they'll be positioned to seize it.

The ability to harness information will become a leading differentiator over the next five years. When BI platforms and tools enable pervasive access optimized for operations across the enterprise, they deliver significant competitive advantage.

That's driving adoption of BI platform technologies; discovery and analytics tools; and vertical, horizontal and other targeted analytics applications capable of handling both traditional and nontraditional data.

### Ways BI Boosts the Business

According to the experts, there are a number of ways that today's business intelligence software can help a business. These include:

- Extract and leverage insights in near-real time
- Eliminate guesswork
- Offer insight into customer behavior
- Identify cross-selling and up-selling opportunities
- Better management of inventory
- Gauge true manufacturing costs
- Streamline operations

### BI at Work in Government

IT teams in government agencies face some challenges that those in the private sector don't — for one, federal and state directives require agencies to provide better transparency into their operations. With spending cuts and lower budget allocations, IT workers are hard-pressed to capture, organize and stage data, and run the reports that decision-makers need to conduct analysis related to organizational performance.

Government agencies are pushing for BI discovery and reporting, analytics and segment-specific applications that provide actionable results so they can also focus on improvement. With taxpayers and watchdogs demanding accountability in spending, BI efforts focus on tracking expenditures and bottom-line figures, optimizing procurement processes, workforce placement, revenue collection efforts and uncovering "bloat."

One area that's benefiting from actionable analytics is fraud detection in government programs, including Social Security, Medicare and public assistance. "Fraud is a big problem for government programs, so agencies are tracking behavior anytime they issue some kind of payment," says Dan Vesset, vice president for business analytics at IDC.

## Don't Set Yourself Up for Failure

BI initiatives can provide significant benefits, but there are numerous reasons that deployments don't achieve desired outcomes. Here are tips to avoid the most common.

### Make Analytics-driven Decisions a Cultural Norm

In large organizations, departments often adopt their own BI tools in a vacuum, and aren't even aware of what other business units are using. Although it makes sense to let departments choose the tools that best address their needs, the approach doesn't deliver intended results unless IT

controls shared databases, storage, hardware and master data, and dictates how tools interact with data.

The growing number of tools, and the discrete and often conflicting insights they deliver when applied to data silos, prevent data-driven actions that improve outcomes at an enterprise level.

### Retain Control Over Organizational Data

Even if lines of business spearhead BI initiatives, the IT department is still on the hook for controlling and protecting the integrity of organizational data.

Given IT's challenges and flat budgets, many departments increasingly find themselves operating in reactive mode, the antithesis of the BI-driven real-time enterprise. As they do with numerous other deployments, taking advantage of software, platform and infrastructure as a service — SaaS, PaaS and IaaS, respectively — IT teams will look to cloud service providers to handle their BI platforms, tools, data management and other functions.

They can choose among public or private cloud services and other hosted options.

### Don't Create Workarounds

The challenges IT teams face with building warehouses for varied departmental needs, as well as running queries and reports, has long caused frustration among users. They'd like to be free of their IT dependence, but most BI products to date "have been deeply sunk into the relational model, and SQL is simply something most people don't understand," Raden says.

Frustration can lead to the splintering of BI tool adoption, resulting in multiple tools in multiple departments, each relying on its own data silos for reporting and analysis. It's common for departments to have "go-to guys" who, while not trained programmers, understand SQL well enough to write queries and create reports.

These kinds of workarounds multiply enterprise BI challenges. They may conflict with IT's data management infrastructure standards for ensuring decisions are based on relevant inter-departmental data. Cross-departmental data is needed to feed BI initiatives related to CRM, supply chain, financials and other business functions. Without it, departments make decisions based on a limited data subset — a risky proposition when accuracy is paramount.

### Consider Business User and IT Needs

BI must be a collaborative effort if organizations ever hope to realize value from their investments. As budgets shift from IT toward lines of business and more managers make BI decisions without the IT staff's input, a cohesive view of all relevant data will be hard to come by.

Balancing user requirements with IT data management mandates dictate that both sides find common ground. One approach has the IT team — by itself or in conjunction with a cloud service provider — managing the data infrastructure and governance and either spearheading or partnering in the tool selection process. Collaborative input helps balance users' BI software needs with the IT department's need to integrate it within the infrastructure.

## Must-Have BI Platform Characteristics

There's much to consider when mapping a BI strategy and choosing a platform and tools. Requirements can differ greatly depending on the organization's industry as well as its customer or constituent base, market dynamics, external pressures and countless other criteria. Nonetheless, there are some common characteristics and capabilities that BI platforms require.

### Actionable, Relevant Analytics

Next-generation BI is a significant departure from legacy BI, which informed individuals via reports and KPI dashboards but didn't provide actionable insight. "Being informed isn't enough; you have to use the information to actually do something," Raden says.

This ability to take action is also critical to ensuring that users across the enterprise, particularly influential decision-makers, actually use the BI solutions available to them. Limited relevance to their departmental business processes and analytics needs contributes to poor uptake rates.

Actionable, relevant analytics allow users to drill much deeper into events. "Users can discover why something happened and the relationships between an event and different entities," Vesset says. "Then they can model scenarios to see what occurs when they apply an action in response to an event."

Also valuable in the BI toolkit are predictive analytics. Sales teams, for example, can conduct predictive assessments on the likelihood of customers buying a product, or whether certain actions will increase aggregate customer retention rates or even retain a single high-profile customer.

High-relevance packaged analytics applications are designed for process- or industry-specific analysis. These applications are built exclusively for a single analytics purpose, such as customer behavior analysis, sentiment analysis, inventory optimization analysis, and numerous horizontal and vertical requirements.

### Workflow, Case Management and Business Controls Library

BI platforms, an integrated data infrastructure and advanced analytics capabilities enable inter-departmental managers to collaborate on enterprise issues that involve multiple business units and data sources. To ensure a collaborative

effort follows defined processes and all input analysis is fed to the appointed decision-makers for action, BI platforms should include the ability to easily map new workflows and track and manage cases.

Organizations have high expectations for the features and functionality new BI solutions can deliver. But what's really important, Raden says, is that "tools have the flexibility to allow users to take intelligent action, communicate activities to others and push data along in the workflow."

## Unified Point-of-Access Tools

To ease IT support burdens and encourage user uptake, BI vendors offer rich SaaS-based BI portals that provide access to reports, dashboards, scorecards and ad-hoc query functions through a single browser-based interface. New interface designs and integration with enterprise data sources present information from multiple departments through a single access point and don't impact the data infrastructure.

These tool- and feature-rich portals tend to encourage a test drive, followed by interest, then reliance, and ultimately, productivity. BI tools won't improve productivity if they're rigid, require opening multiple windows or aren't based on a common platform that allows users to easily collaborate and share business insights.

## When BI Trends Collide

BI is benefitting from a convergence of technologies — each of which is having its own major impact on how organizations conduct business — that together are pushing BI to an entirely new level of importance. Five BI trends are collectively propelling platform and tool adoption to the point that employees enterprisewide can positively impact performance.

The top five trends, according to analysts, include:

- Mobile BI apps
- Cloud-hosted BI solutions
- Self-service BI, operational
- Tactical BI
- Pervasive BI

Mobility's impact stems from both its anytime, anywhere and user experience characteristics. The consumerization of mobile devices and new mobile-optimized BI applications have everyone from C-suite executives to sales managers, field staff members, factory floor operations directors and support personnel signing on.

"Mobile devices provide a user-friendly touch experience where business users get BI insight at any time. If adoption is about the user experience, then it's increasingly about the mobile touch experience," Greenbaum says.

For a growing number of BI deployments, the cloud is the place to be. "With BI in the cloud, IT budgets take less of a hit thanks to small upfront investments and continuing financing coming out of the operational budget," Vesset says. "Employees use online tools so there's no need for frequent IT intervention as long as they have access to data."

Self-service BI, meanwhile, is closing the gap between data need and delivery, as well as empowering a broad spectrum of enterprise users. Contributing to uptake is the acceptance that time can no longer stand still while IT deals with report backlogs, and business can no longer stand still while BI users try to figure out what to do next.

These capabilities flow into operational and tactical BI practices, further fueled by in-memory computing and actionable, on-the-fly analytics. No longer are decision-makers constrained by snapshots of predefined time intervals. Because organizations have their dials turned on 24x7, users can get a snapshot of any time period, any time they choose.

Finally, there's the push toward pervasive BI, where, theoretically, every employee in the enterprise has access to BI tools for insight and decision-making. The objective of pervasive BI is to break down both these use-related barriers, by putting BI in the hands of all employees and making it so user-friendly that they'll buy in.

### BI at Work in Education

Education, like government, differs from business in its application of BI and its key performance indicators (KPIs) and metrics. Many metrics considered mandatory for measuring business performance have no relevance for education, while educational analytics don't match up with typical business analytics.

Student retention is one area in which analytics is providing valuable insight, enabling administrators to analyze individual and aggregate student activity data and prescribe actions. Many school districts and colleges are able to track student activity. In the K–12 environment, teachers now often gather performance data and information in real time using smartphones and other mobile devices. They can also use BI to identify at-risk students and compare data to conclude which interventions are helping the most.

Meanwhile, on campuses, students use identification cards that they swipe when they go to the gym, dining halls and bookstores. Class attendance can be monitored based on student logins for course materials. And schools can monitor student security by tracking activity and movement based on card use.

# CDW: A Business Intelligence Partner That Gets IT

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