

## WHITE PAPER

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# Improving Organizational Performance Management Through Pervasive Business Intelligence

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## EXECUTIVE SUMMARY

Evidence of the competitive value of business intelligence (BI) and analytics solutions is growing. Fact-based decision making is spreading throughout commercial, nonprofit, and public sector organizations. The economic downturn is spurring organizations to examine ways of retaining customers, spending capital and operating budgets, and complying with regulations. However, over the long term, BI solutions will continue to be applied to optimize a wide array of processes in an effort to improve performance management and organizational competitiveness.

An increasing number of organizations are making BI and analytics functionality more broadly available to all decision makers inside and outside the organization. Internally, more pervasively available BI solutions lead to greater accountability by all employees and greater consistency in performance management. Externally, relationships with supplier and partners can be strengthened through effective sharing of key performance indicators (KPIs). However, having pervasive BI means more than having the appropriate BI tools distributed to all stakeholders. In pursuit of pervasive BI, organizations should focus on the five key factors that can be directly influenced to increase diffusion of BI. They are:

- ☒ **Degree of training on the data, tools, and analytic techniques**
- ☒ **Design quality of the BI solution**
- ☒ **Prominence of data governance**
- ☒ **Nonexecutive involvement in promoting the design and use of BI solutions**
- ☒ **Prominence of a performance management methodology**

These factors have to do as much with BI and analytics technology as they do with the related professional services for BI strategy and solution development, deployment, and maintenance.

## IN THIS WHITE PAPER

In this white paper IDC discusses the growing body of evidence suggesting a direct link between investment in business analytics solutions and organizational performance. IDC highlights market trends that point toward more pervasive use of BI solutions. The recommendations presented in this white paper are based on ongoing IDC coverage of the BI and analytics solutions market with specific focus on return on investment (ROI) and diffusion of the business analytics technology and BI processes.

## INVESTING IN BUSINESS INTELLIGENCE

The extent of BI pervasiveness is a statistically significant predictor of organizational competitiveness and performance — this is one of the most significant conclusions from a recent IDC research project entitled *Improving Organizational Decision-Making Through Pervasive Business Intelligence: The Five Key Factors That Lead to Business Intelligence Diffusion*.<sup>1</sup> The study, based on in-depth interviews of midsize and large organizations and a survey of 1,141 organizations across 11 countries, sheds light on the importance of BI solutions as an enabler of competitiveness.

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Although both interest and investment in BI and analytics solutions are growing, we would not anticipate organizations investing in these solutions unless there was some belief that they would eventually benefit from it. The need for quantifiable benefits is made even stronger in difficult economic times when discontinuous change pushes more decision makers to rely on fact-based insight rather than only their experience or intuition. IDC's market research provides growing evidence of the potential value of BI and analytics solutions.

☒ In surveys conducted by IDC throughout 2008, we found that:

- ☐ About half of all respondents indicated that BI and analytics was a top priority for their organizations. In fact, over a six-month period in 2008, the priority ranking increased.<sup>2,3</sup>
- ☐ Among 18 application software segments, BI software ranked as the second highest that organizations expect to purchase, upgrade, or replace over the next 12 months. The only application software segment expected to garner more investment in the short term is project and portfolio management.<sup>4</sup>
- ☐ Surveys conducted from February to October 2008 indicate that a majority of organizations plan to maintain flat BI budgets, with only 8% of organizations expecting a decrease in BI budgets over the coming year.

☒ In 2003, IDC released the results of a study titled *Leveraging the Foundations of Wisdom: The Financial Impact of Business Analytics* that was based on in-depth evaluation of the ROI of business analytics projects at 43 leading organizations in North America and Western Europe. The median ROI of business analytics projects was 112%.<sup>5</sup>

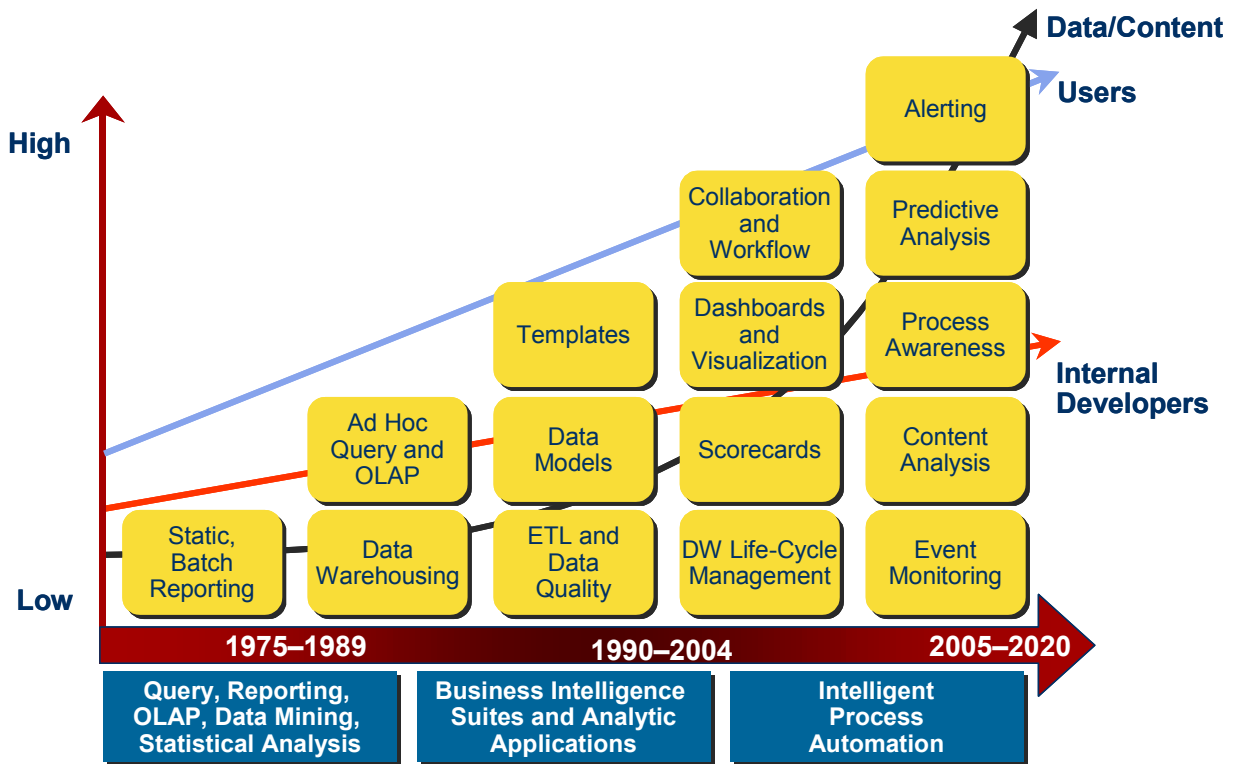
The median ROI of business analytics projects was 112%.

- ☒ Additional research from academic institutions provides further proof points of the value of business analytics. Examples include a *Harvard Business Review* article and a subsequent book entitled *Competing on Analytics*.<sup>6</sup>

The latest developments in the business analytics market, in which about \$23 billion was spent on software alone in 2008, are based on the foundation laid in the industry over the past 30-plus years. As shown in Figure 1, although BI and analytics solutions are not new, they are only now entering the mainstream.

**FIGURE 1**

**Business Intelligence and Analytics Market Trends**



Source: IDC, 2009

The market, which seems to be moving in 15-year cycles, continues to evolve by incorporating new components. What started out as standalone batch reporting and statistics tools has matured into broad suites of components that address data integration, data warehousing, query and reporting, advanced analytic, and other related components that address organizational needs as diverse as master data management (MDM) and real-time alerting. Based on these trends, IDC believes that the market has begun to focus on broader diffusion of BI only during the current 15-year market cycle. But what does it mean to have pervasive BI?

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## PERVASIVE BUSINESS INTELLIGENCE

Pervasive BI results when organizational culture, business processes, and technologies are designed and implemented with the goal of improving the strategic and operational decision-making capabilities of a wide range of internal and external stakeholders. IDC has identified six indicators of pervasive BI, as shown on the horizontal axis of Figure 2. The indicators are as follows:

**Degree of internal use** by employees at all levels; **degree of external use** by stakeholders such as customers, suppliers, and government agencies; **percentage of power users** within an organization; **number of domains** within the primary data warehouse; appropriateness of **data update frequency** to support business decision making; and **analytical orientation**, an indicator that consists of elements dealing with information sharing, importance of and reliance on analytics for decision making, and the influence BI has on an employee's actions.

Organizations embarking on or continuing on their path toward pervasive BI need to decide how to allocate their scarce human, capital, and IT resources to tasks and projects that have the biggest impact on increasing the diffusion of BI throughout their organizations and to external stakeholders. There are potentially large capital and human costs involved in defining metrics and KPIs; assembling, cleansing, staging, and analyzing data; and disseminating and presenting information. As organizations move along the path toward pervasive BI, the needs and requirements of end users increase, resulting in a widening gap between the demand for and supply of business analytics solutions (refer back to Figure 1). This gap can be closed by employing more automation and utilizing external service providers.

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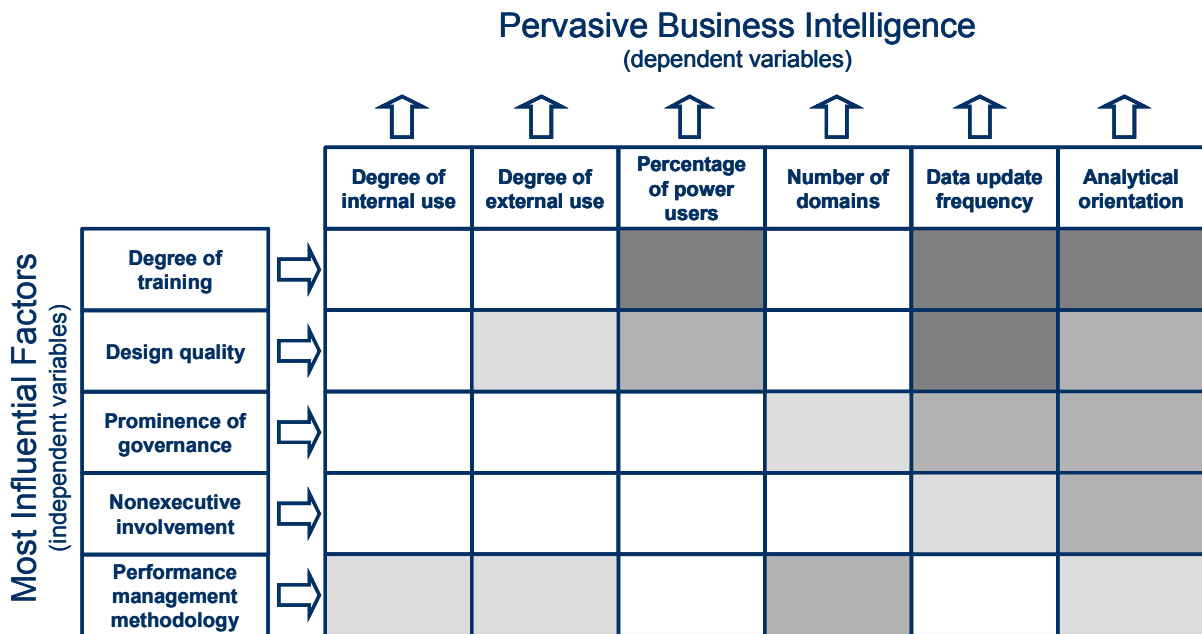
IDC has identified five key factors that have the strongest influence on BI pervasiveness, as shown on the vertical axis of Figure 2. These factors are as follows:

- ☒ **Degree of training** refers to the satisfaction level with training on the meaning of data, the use of BI tools, and the use of analytics to improve decision making.
- ☒ **Design quality** refers to the extent to which end users' expectations about the speed of adding various BI solution components by the IT group are met.
- ☒ **Prominence of governance** refers to the existence of and the importance of a data governance group and associated data governance policies in BI system design or enhancement initiatives.
- ☒ **Nonexecutive involvement** refers to the level of nonexecutive management's involvement in promoting and encouraging the design and use of the BI solution at the organization.
- ☒ **Prominence of performance management methodology** refers to the existence of and the level of importance within the organization of a formal performance management methodology.

The model shown in Figure 2 depicts the relationship between the six pervasive BI indicators (dependent variables) and the five key factors leading to pervasive BI (independent variables). The shading schema identifies independent variables that have a statistically significant impact on the corresponding dependent variables. The three levels of shading represent the level to which a unit change in a given independent variable affects a change in the dependent variable. For example, Figure 2 shows that statistically, the degree of internal use of the BI solution can be affected most by focusing on deploying and encouraging the use of a performance management methodology. Analytical orientation can be affected by focusing on all five factors. The unshaded cells do not indicate that any given factor should be ignored when trying to influence any of the six indicators — there is simply no statistically significant relationship based on IDC's chosen analytic technique.

**FIGURE 2**

The Five Factors of Influence on Pervasive Business Intelligence



Note: The shading schema identifies independent variables that have a statistically significant impact on the corresponding dependent variable. The three levels of shading represent the level to which a unit change in a given independent variable affects a change in the dependent variable.

Source: IDC, 2009

## THE IMPACT OF BUSINESS ANALYTICS SERVICES ON PERVASIVE BI

The IDC pervasive BI model can be used as a guide to help make critical decisions pertaining to resource allocation for supporting successful deployment of BI solutions. One of the conclusions we draw from the model is that services are as important to successful business analytics projects as technology. The five factors with greatest influence on the pervasiveness of BI are highly dependent on professional services associated with each of the potential focus areas. Services can provide strategic and tactical resources to execute on the vision of pervasive BI and organizationwide performance management.

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### Degree of Training

The first key factor leading to more pervasive BI is the *degree of training*. It refers to an interrelated set of variables that organizations should consider as part of their overall BI program. These variables include the following:

- ☒ Level of satisfaction with training on the meaning of data, metrics, or KPIs; the use of the BI tools; the use of analytics to improve decision making
- ☒ Level of ease with which end users learn how to use the organization's BI tools
- ☒ Level of ease with which data from different organizational domains (e.g., finance, manufacturing, and human resources) can be correlated

### Recommendations

- ☒ Be aware of the positive impact that improving the degree of training, as defined above, can have on the pervasiveness of BI. Training on the use of data and training on the BI tools are independently important and additively important. Organizations have a choice to train users on the use of tools or the use of data. Although either type of training can increase BI pervasiveness, doing both types of training can have an even greater positive effect on BI pervasiveness.
- ☒ Training does not refer only to classroom or online courses. To enable better understanding of information, organizations should expose as much BI content metadata, or information about the data, metrics, and KPIs, as possible directly in reports and dashboards. This can be accomplished through something as simple as having highly descriptive report or dashboard titles or through features such as "pop-up" definitions of each KPI on mouseovers. The metadata can include the description of KPIs, data lineage, and other relevant descriptors. Assuming that organizationwide definitions of such BI content exist, exposing the BI content metadata will assist in eliminating misunderstandings about the information made available through a BI solution.

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## **Design Quality**

*Design quality* is another factor that has a strong effect on pervasive BI. Design quality refers to the extent that end users' expectations about the speed of adding various BI solution components by the IT group or a consulting partners are met. A BI solution must be able to address not only the needs of various end-user groups but also those of the IT group in its effort to support the ongoing BI needs of end users. From a system design perspective, the user interface is especially important to broader use of the BI solution. While logical understanding of the value of BI exists among most end users, the emotional attachment to a product (or service) leads to pervasiveness. We observed this phenomenon in many organizations.

When a BI solution is well designed, it is easier to add new data sources, new domains, new reports, new metrics, and new data hierarchies to it. The design quality can be viewed as a proxy for system flexibility and organizational agility in responding to ongoing decision support demands. Dissatisfaction with an IT group's ability to rapidly respond to new requests is the primary cause for end users to seek alternative BI solutions to those provided by central IT resources. Thus, insufficient design quality often leads to silos of information that don't follow data governance policies, decentralized purchasing of software by business groups, manual aggregation of data in spreadsheet with no security or process controls, and the creation of "shadow" IT groups within business units or departments.

### ***Recommendations***

- ☒ Work with your services partner to create an enterprisewide BI strategy. Although BI should be viewed as an ongoing program rather than a one-off project, the deployment of individual solutions should be done iteratively. A common characteristic of business analytics system design among leading organizations is the extensive use of rapid prototyping and the AGILE method of software development. This seems to be the only effective method to match IT development plans with frequently changing end-user BI requirements.
- ☒ Initiate a requirements-gathering process that is not predicated on asking end users "What data do you need?" When IT groups deploy BI solutions without direct business end-user input, they find that these technology deployments remain idle or substantially underutilized. Asking end users for their BI system requirements usually results in a question from end users about what data is available, a wish list of all possible information, or simply a request for electronic versions of previously available paper reports. Leading organizations evaluate end-user decision-making processes, not simply data requirements. In other words, they ask, "What decisions do you make?"

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## **Prominence of Governance**

*Prominence of governance* refers specifically to the existence of and the importance of a data governance group and associated data governance policies in BI system design or enhancement initiatives. About 10% of organizations in our research do not have a data governance group or associated data governance policies.

Organizations that have more experience with BI assign more importance to governance. Also, those organizations that rank themselves as more competitive within their industry tend to place greater importance on data governance.

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The development of agreement on the meaning of data elements and the subsequent need to train end users on what the data represents are key to the diffusion of BI solutions. Without governance, there may not be consensus regarding what the data means, thus guaranteeing BI a noncentral role in decision making. In some sense, when decision making is based on unarticulated, estimated data, decisions are made in an environment of strategic ambiguity — decision makers understand each other less than they think they do.

### **Recommendations**

☒ There are no easy solutions to data governance issues, and it is important not to underestimate the time and effort involved in bringing various internal parties into agreement about the meaning and value of data, metrics, and KPIs. Allocate sufficient time to this process to resolve data governance, MDM, and data quality issues. Part of the problem is that in most sizable organizations, the division of labor has resulted not only in data silos but also in process silos, with no single person or group responsible for end-to-end processes and associated data.

☒ Our research suggests that a best practice is to set up a governance body as a virtual entity that is made up of employees with decision-making authority. Much of the job of the governance body is to explain, cajole, influence, placate, and otherwise bring different end-user groups into agreement about a common language for managing organizational performance. Thus, a governance body must show leadership in resolving any intergroup conflicts. Many organizations effectively utilize external consultants as part of the data governance body to help facilitate communication among internal user groups.

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## **Nonexecutive Involvement**

*Nonexecutive involvement* refers to the level of nonexecutive management's involvement in promoting and encouraging the *design* and *use* (separately) of the BI solution at the organization. As shown in Figure 2, this factor has the highest influence on the following pervasive BI indicators: *data update frequency* and *analytical orientation*. Organizations that assess themselves as being more competitive have a higher level of *nonexecutive involvement*.

One of the common techniques for expanding the use of BI functionality is for the BI group to seek out a partner in one business group and provide that individual with information and BI tools that can give that person an advantage over his or her peers during meetings and collaborative decision-making sessions. There are many examples where the resulting "BI envy" leads those without the latest information and BI tools to request it from the BI group. However, it is important to note that the spread of BI tools and processes in an organization is not "viral," as some pundits would say. Unlike biological viruses, BI use does not spread simply by association. It requires the "unaffected" party to consciously agree to start using BI, which is likely to happen only if that party understands the data, understands the BI tool, and sees value in using both.

## **Recommendations**

- ☒ Statistically, nonexecutive management's involvement in BI has more influence on the pervasiveness of BI than the involvement of executive management. The existing literature regarding BI and analytics suggests that executives must be involved in BI initiatives in order for them to lead to analytic organizations.<sup>7</sup> Our research confirms that executives must be involved, but their involvement should be different from that of nonexecutive management. The biggest impact of executives is that they usually initiate and provide funding for BI project, while nonexecutive management can be more influential in driving these projects once they have been launched.
  
- ☒ One of the key lessons from our research is the recognition of the importance of a "champion" to expanding the use of the BI solution throughout the organization. The "champion" could be a single person, or a small team of employees, with the vision and expertise to convince key business stakeholders about the potential positive impact that a BI solution could have on the performance of an organization. These BI project "champions," who persist in using a BI solution and encourage colleagues to do the same, most often come from the ranks of nonexecutive managers. The association of nonexecutive managers in meetings facilitates information sharing<sup>8</sup> and, subsequently, BI solution diffusion.

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## **Prominence of Performance Management Methodology**

*Prominence of performance management methodology* refers to the existence of and the importance of a performance management methodology within an organization. One of the keys to an effective BI and performance management solution is to ensure a direct connection between business strategy and actionable KPIs as well as a subsequent link between strategic and operational KPIs. Such tiered KPIs are usually established in the context of a performance management methodology. Several industry-standard performance management methodologies, such as the balanced scorecard, exist. However, organizations can and also do develop their own methodologies or look to their IT product and service providers to assist with developing and deploying such a methodology.

Based on IDC's pervasive BI study, 75% of organizations that rate themselves as most competitive in their industry use a formal performance management methodology; this rate drops to 43% for the least competitive organizations. A similar observation can be made about the *importance* of the performance management methodology. The use of the balanced scorecard or a similar methodology demonstrates how this factor can affect the *number of domains* pervasive BI indicator. The cross-domain nature of this methodology forces an organization looking to automate some aspects of the balanced scorecard to ensure that all organizations' domains or subject areas are represented in the BI solution.

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## **Recommendations**

- ☒ If your organization doesn't already employ a formal performance management methodology, evaluate your technology vendor's capabilities for recommending and assisting in deploying such a methodology. Consultants' experiences span many companies within an industry, and they are able to bring best practices in performance management to their clients' organizations.
  
- ☒ The success of performance management efforts depends in large part on expanding accountability within the organization through the availability of metrics and KPIs for all employees and by tying a portion of compensation to performance metrics. Services partners can assist in identifying the most relevant KPIs as part of the performance management methodology deployment.

## **EVALUATING SERVICES PROVIDERS**

As the market research evidence presented demonstrates, professional services, along with appropriate business analytics technology, can play a key part in enabling pervasive BI, which in turn can lead to greater competitiveness and improved performance.<sup>9</sup>

When evaluating professional services vendors for BI and analytics projects, organizations should review several criteria, including the vendors' BI and analytics methodology, availability of local and off-shore staff, pricing structure (e.g., fixed bid or hourly time and expense), and range of experts available across the different technology and business processes involved in a typical BI and analytics project.

Typical BI and analytics project methodologies include steps such as BI strategy development; requirements gathering; design of the BI and analytics solution architecture; development of the various data integration, data warehousing, and end-user query, reporting, and analysis components of the solution; deployment of the solution; and related training and support.

Although SAP is known primarily for its extensive software portfolio provided by the SAP BusinessObjects division, the company also provides a range of BI professional services. These services utilize such SAP methodologies as ASAP Methodology, SAP Road Map Composer, and SAP Strategic Data Services for SAP NetWeaver MDM, among others.

SAP BI and analytics professional services place a strong focus on identifying an organization's strategic and operational goals and linking them to specific KPIs. These steps not only help identify the needs of individual decision makers but also help implement a performance management initiative with the right scope and focus. Once the KPIs are identified, the subsequent services methodology steps address the requirements for data integration, data quality, data governance, and master data management. The third major element of SAP's methodology revolves around ensuring broad adoption of the BI and analytics solution by delivering user-friendly information access. End-user needs are evaluated based on specific roles, and recommendations of specific user interfaces for various user groups from the executives to line-of-business employees are developed prior to technology implementation and deployment.

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## OPPORTUNITIES AND CHALLENGES

The long-term trends suggest that the market is still in the early stages of a BI solution adoption cycle that will extend the reach of various decision support and decision automation solutions to a broad set of new users. These users will span all levels of an organization and will be involved in a spectrum of strategic and operational decision-making activities. Some of these activities will be based on information access through reports, dashboards, or search boxes. Other BI activities will include advanced analytic techniques for descriptive and predictive analytics.

Organizations investing in BI and performance management have many opportunities to take advantage of the growing body of evidence suggesting a direct link between these solutions and organizational competitiveness and performance. These opportunities must make effective use of both IT products and services as well business process reorganization and organizational behavior changes necessary to shift toward more fact-based decision-making processes.

At the same time, organizations will increase their chances of BI project success and overcome technical and organizational challenges by following methodologies, such as those presented in this document. Whether an organization chooses to partner with SAP or another solution provider, IDC, as always, encourages all organizations to evaluate any IT vendor based on specific technology features and functionality, services offerings, support structure, expertise within the selected technology or business area, financial strength, and availability and quality of partners.

## RELATED RESEARCH AND REFERENCES

1. *Improving Organizational Decision-Making Through Pervasive Business Intelligence: The Five Key Factors That Lead to Business Intelligence Diffusion*, IDC multiclient study, November 2008.
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8. Sinan Aral, Erik Brynjolfsson, Marshall Van Alstyne, "Productivity Effects of Information Diffusion in Networks," The MIT Center for Digital Business, July 2007.

9. The research results highlighted in this white paper were the outcome of IDC's study *Improving Organizational Decision-Making Through Pervasive Business Intelligence: The Five Key Factors That Lead to Business Intelligence Diffusion*. The research (methodology and execution) was completed by IDC in collaboration with researchers from Boston University School of Management Systems Research Center and was underwritten by 11 competing business analytics solution providers, including SAP.

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