

BUSINESS INTELLIGENCE

THE DEFINITIVE GUIDE
FOR MIDSIZE ORGANIZATIONS



SAP White Paper
Business Intelligence

THE BEST-RUN BUSINESSES RUN SAP™



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Schiff was the vice president of the data warehousing and business intelligence service at Current Analysis Inc., an industry analyst firm where he provided tactical market intelligence and analysis while managing the company's e-business analyst team. He was the executive director of data warehousing and advanced decision support for Oracle Corporation's Public Sector Group and director of software AG's data management program. In 1984, while at Digital Equipment Corporation, he formulated the architecture for one of the first successful data warehouse implementations. He earned his bachelor and master of science degrees from MIT's Sloan School of Management where he specialized in operations research as an undergraduate, and in information systems as a graduate.

Overview

Business intelligence is not a new concept; it's been used for years by IT staffers in large enterprises with the budgets to support it. What's new is the fact that business intelligence tools are now affordable and accessible even for midsize companies – and even for the nontechnical business user. Now managers can use these products for sophisticated analysis of complex information to support their decision-making processes. They can combine data from a wide variety of sources and see an integrated, up-to-date, 360-degree view. For midsize companies the key is to select the right product, the right vendor, and the right approach.

NEW TOOLS FOR A PROMISING FUTURE

TOWARD MORE SOPHISTICATED ANALYSIS

If your organization is like most, your primary focus is acquiring customers, increasing revenues and profitability, and outpacing the competition. And while your organization continues to improve its operating efficiencies, you recognize the need to spend more time analyzing what's going on and planning for the future than solving operational problems and putting out fires.

Furthermore, you need to determine where to concentrate your efforts. You can't check every detail, yet there must be a way to monitor operations while identifying and leveraging new opportunities. And you need to ensure that employee and departmental metrics are aligned with overall strategic goals.

Your organization may not have the resources of a FORTUNE 500 company,

but your employees are passionate about their jobs and committed to your customers. Maybe your company is relatively small right now, but it's on a high-growth path. You're aware of the power of business intelligence and know that larger companies – and maybe even your direct competitors – are using it to their advantage. At this stage of your company's evolution, isn't it time your analysis capabilities graduated from spreadsheets to more powerful tools as well?

How to Recognize the Need for Business Intelligence

The following represents typical situations that could benefit from improved business intelligence:

- **Competing versions of the truth** – Interdepartmental meetings frequently turn contentious as participants debate whose spreadsheet has the correct figures.
- **Inability to perform in-depth analysis** – Your company knows which of its retail outlets have the greatest sales volume but can't identify which products have the highest sales.
- **Difficulty locating important information** – You recently heard that a report showing year-over-year growth for each customer has been posted to the intranet – but have no idea how to find it.
- **Need for simple-to-use production reporting technology** – Your accounting department uses word processing to generate customer invoices, resulting in errors and customer complaints.
- **Inability to comply with government reporting requirements** – Your company plans to go public at some point, and you need proper audit trails and data lineage to ensure financial accuracy.
- **Lack of timely reports** – IT is unable to fulfill managers' requests for reports when they want them.
- **Difficulty consolidating data for integrated information access** – Reports that require data from multiple operational systems involve generating separate reports from each and then combining the results in a spreadsheet.

DEFINING BUSINESS INTELLIGENCE

HOW BI IS HELPING MIDSIZE ORGANIZATIONS

A major part of any manager's job is to make decisions. If you can improve the overall quality of your organization's decision-making process, you'll improve the overall effectiveness of your organization. In short, business intelligence helps your organization make smarter decisions – hence its original description as “decision support.”

Business intelligence (BI) allows organizations to better understand, analyze, and even predict what's occurring in their company. BI helps your organization turn data into useful and meaningful information and then distribute this information to those who need it, when they need it – thereby enabling them to make timely and better-informed decisions. It allows organizations to combine data from a wide variety of sources and see an integrated, up-to-date, 360-degree view.

This is especially important for midsize companies that are typically able to implement business decisions relatively quickly. BI provides a win-win solution for IT and business users by allowing the IT department to be more productive in working with its business users to service special requests, while permitting these business users to become more self-sufficient. Operations and analysis are two sides of the business, and BI allows IT to be a valued partner in both.

For example, a midsize organization can use BI to do the following:

- Identify customers that are cutting back on their purchases so that special inducements can be offered to retain them
- Implement dashboards and scorecards to help executives and supervisors quickly recognize operational exceptions or potential budget overruns
- Compare departmental turnover to identify potential morale problems
- Track customer orders and desired ship dates against finished goods inventory, and adjust the manufacturing production cycle and supply chain logistics to reduce inventory carrying costs
- Integrate operational, spreadsheet, and historic data for analysis purposes, while providing consistency and “a single version of the truth”
- Better understand and analyze operations and customer interactions to gain a competitive edge
- Align daily operations with strategic objectives and quickly recognize when they are not in agreement

The BI Spectrum

The BI spectrum is very broad in terms of its tools and functionality. At its core is the traditional functionality of query, reporting, and analysis. This is complemented by data quality and data integration to accurately and consistently consolidate data from multiple sources. Dashboards and other visualization techniques can help users quickly understand analysis results and are often considered part of the BI spectrum. BI can also encompass search functionality for locating information and reports, predictive analysis to discover hidden patterns and enable what-if analysis, and scorecards and performance management to help monitor business metrics and key performance indicators (KPIs). These KPIs might

include customer satisfaction, profitability, and sales per employee and be monitored to support alignment of individual and departmental metrics and the organization's strategic goals.

Queries

A simple query might access your company's data to ask, for example, what were total sales to Plushrock Corporation last December? or what's the current salary of employee Dan Evans? or even how many AA batteries do we have in inventory? Most query tools also provide simple reporting functionality and could also be used, for example, to generate a simple report listing the accrued vacation of all employees, sorted and totaled by department.

Reporting

Enterprise or production reporting typically involves high-volume, high-resolution reports that are run on a regular basis. An example might be a sales manager report showing monthly sales and associated commissions sorted by salesperson and then by customer. The report distribution would likely be controlled so that each sales manager could see entries only for his or her salespeople. The report might be e-mailed to them or viewed through a Web browser. Enterprise reports can also be used to generate customer statements or invoices or individualized benefit summaries for each employee.

Advanced Analysis

With advanced analysis functionality, users can view data across multiple classifications or dimensions (for example, product, customer, location, time period,

and salesperson). They can slice and dice the data to look at various combinations, such as the sales in each region for December or which products each customer purchased last year. Advanced analysis functionality also permits organizations to define hierarchies so that, for example, a user could first view sales for each region and then drill down to view the sales in each country, of each product in each store, or for each salesperson. These advanced analytics make it easy to compare the results from one time period with another – this July’s product sales with last July’s, for example – while performing year-over-year comparisons by store, customer, or salesperson.

Other advanced functionality, such as filtering, can be used to include or exclude specific stores, regions, products, salespeople, or time periods – and look at the top or bottom best- or worst-performing products, stores, or salespeople. Combined with drill-down, slice-and-dice, and filtering functionality, this is a powerful multidimensional analysis.

Interactive Analysis

Simple reports were initially designed for passive viewing, while advanced products perform interactive analyses. Many of these advanced functionalities were once available only in specialized online analytical processing (OLAP) products that involved the use of proprietary databases and highly skilled technical specialists. Now OLAP functionality is often incorporated into query and analysis tools. Thus, business users can perform interactive analysis and, for example, click on a number in a report to drill down to and analyze the underlying details. Effective BI should be an interactive process, and query and analysis tools – with embedded OLAP functionality – permit business users to perform dynamic analyses on their data. As most IT practitioners will attest, users requesting a static report will typically ask for additional modifications and details. Query and analysis tools allow business users to formulate a high-level query and then immediately explore the underlying details on their own.

Core BI technology – such as query, reporting, and interactive analysis – is used to view or analyze what is or has already occurred, while data mining and predictive analysis allow users to predict what may occur. BI technology uses sophisticated statistical techniques to find relationships that are hidden or not obvious. It can be used to identify which factors closely relate to customer churn and attrition or which factors (a prospect’s income, education, age, last purchase amount, and so forth) were most closely related to a successful response in a marketing campaign.

Graphical Techniques

A picture is worth a thousand numbers, and graphical techniques – including dashboards – strongly complement the other members of the BI spectrum. With graphical gauges analogous to an automobile dashboard and symbols such as traffic lights, where red represents an alert condition and yellow a warning, users can quickly identify exception conditions. It has often been said that “if you can’t measure it, you can’t manage it.” Scorecards and other performance management tools enable you to establish business metrics, update and monitor the results, and communicate them as appropriate so that minor problems can be identified early on and corrective action quickly taken. Dashboards are frequently used to display performance metrics and can allow users to drill down from the visual image to view the underlying detail. Other visualization techniques include “slider bars” that allow a user to perform what-if analyses and, for

Star Trac, of Irvine, California, is a midsize manufacturer of quality physical fitness equipment serving a global market. Like many rapidly growing companies, its data was spread across multiple silos, making it difficult to aggregate and reconcile to facilitate decision making and align key objectives and business processes. Star Trac needed a product suite that offered flexible reporting, ad hoc query and analysis, interactive

dashboards, and visual analytics. “Fast, easy business intelligence will save us time, boost productivity, and deliver the data to help us grow the business,” says Jeff Kuckenbaker, senior director of information systems. “We’ll use BusinessObjects Edge to deliver information across the company so everyone can better understand how to execute our strategies for growth.”

The enduring value Anna's Linens gets from its Business Objects™ business intelligence solution lies in the ability for managers to communicate what is expected of their employees and to provide the tools for them to measure their performance as they execute on those goals. "If we can measure performance, we can reward performance," says COO Scott Gladstone. "This allows us to develop an incentive program that is performance based and is aligned with the strategic initiatives of the company. Once we have the entire company executing against our strategic growth plans, we are sure of success. With Business Objects business intelligence tools at our fingertips, Anna's Linens is in a great position to grow."

example, show how profit margins would increase if maintenance revenues were increased or distribution expense reduced.

Distribution and Control

Business intelligence is not just about tools and their applications; it's also concerned with distribution and control. Companies should be able to publish reports to the Web and deliver them to a user's preferred mobile device. However, not every employee should have access to every report or analysis, and administration, monitoring, security, and control are also part of the BI environment. Furthermore, the use of commercial BI products does not

Sole Technology Inc. is a globally recognized leader in action sports footwear and apparel. In the last three years, Sole Technology doubled in size, rendering the company's small-business approach to reporting insufficient. George Bock, senior director of IT at Sole Technology, says, "We struggled at getting data into the hands of people that needed it, when they needed it, so we could make better business decisions."

Sole Technology needed to track the life cycle of products, from development through production, shipping, warehousing, sales, and inventory. It also needed to ensure that everyone speaks the same business language, so employees in various locations agree on a standard definition of terms when discussing concepts such as revenue, inventories, and discounts.

"Business Objects brought tool sets and technologies that were out of our range down to our market level – debunking the myth that Business Objects isn't affordable," says Bock. "They've allowed our use of enterprise technology to be a reality."

necessarily mean the elimination of spreadsheets. Rather, BI can provide controlled linkage of spreadsheets to up-to-date data while enforcing proper distribution and control. This way, "spreadsheet chaos" is no longer an

issue, and trying to determine whose spreadsheet is "more correct" is no longer part of every company meeting. The ability to locate and search out relevant reports is also part of the BI landscape, as a report is of little value if no one knows it exists or how to find it.

Function- and Industry-Specific BI Applications

In addition to BI tools, some vendors offer BI-based analytic applications covering a wide range of business functions and industries. Areas of focus include long-range planning, budgeting and planning, financial reporting and consolidation, incentive compensation management, activity-based costing, metrics, and scorecards. Other functional areas might include applications for sales analysis and campaign management, contact center analysis, product and service analysis, workforce analysis, supply chain intelligence, and compliance.

Examples of industry applications include those oriented toward telecommunications, healthcare, public services, retail, and consumer products. These applications are often available both from the BI vendor and its software development partners that utilize the vendor's BI technology as the development platform for specialized industry and functional analytic applications. While midsize organizations moving from a spreadsheet environment to formal BI tools may not initially invest in the full range of tools, these analytic applications will be there when needed.

Using BI in Different Environments

BI can be used in data warehouse environments, in which snapshots of data from multiple systems are consolidated for analysis, and with operational systems. When deployed against operational systems (that is, those that help run or operate the business), BI might be used to show current values such as inventory levels, outstanding customer balances, salaries, or student attendance.

When deployed against a data warehouse, BI often involves comparing the results of one period with another. (A data warehouse contains data values taken at different points in time, frequently sourced from several operational systems through the use of data integration and data quality technology.) A typical use would be to compare this quarter's sales against the same quarter in each of the preceding three years. Some data integration vendors offer connectors or integration kits to facilitate access to commercial enterprise application software products, such as those of SAP and Oracle Corporation's J.D. Edwards, PeopleSoft, and Siebel applications.

The Importance of Data Quality

Data quality is of paramount importance in both operational systems and data warehouses. In an operational environment, no one wants to ship the wrong order to the wrong address, provide a patient with the wrong medication, or transfer funds to the wrong bank account. In a data warehouse environment, no one wants to make decisions based on incomplete, incorrect, or inconsistent data. The deployment of data quality tools can help ensure that this does not happen. By using BI against both operational systems and data warehouses, a company can improve its daily operations and compare current results with historic values to identify trends and head off problems before they become more serious.

THE BENEFITS OF BI

HEADING OFF ISSUES – IDENTIFYING OPPORTUNITIES

BI allows business users to analyze and better understand their organization's plans and results. It provides insight into what's working correctly – and highlights potential opportunities – while identifying problem areas in time to take corrective actions. For example, it can alert you when certain exception conditions occur, such as sales dropping 20% below forecast or inventory falling below a threshold value.

Since BI product suites include a variety of components, organizations can pick those that are most appropriate for the task at hand and for the experience level of their individual employees.

While in the past only technical specialists used BI tools, most businesspeople can now use them successfully as well. This has served to democratize BI usage throughout organizations.

The role of IT has positively evolved from one of digging out from its historic report request backlog to one of monitoring and administering BI usage, and setting the appropriate controls relative to who can access what data. This self-sufficiency has thus enabled IT staff to free up time to serve the organization more effectively and efficiently.

While many managers and supervisors pride themselves on their intuition, BI provides tools to help verify their insights and even discover new ones. It permits business users to explore results at a high level and then drill down to analyze the underlying details. Business intelligence is one of the primary keys to effective decision making.

APPROACHES TO IMPLEMENTING BI

SETTING THE STAGE FOR GROWTH

Beginning a BI initiative is not necessarily expensive. This is true especially if you choose a vendor with a suite of products that allows you to easily expand your BI usage and implement the tools you need as your business continues to expand.

Getting Started

As your company transitions to a BI environment, it often makes sense to start small – perhaps deploying BI against one system with a query and reporting tool. Your company can expand its deployments to additional systems and use more functionality as the organization masters the technology. One place to start is with the system that has the greatest reports backlog. While the IT department can certainly use BI tools to reduce this backlog, the ultimate goal should be to make your business users self-sufficient and less dependent on IT for their analyses.

IT can assist business users by using the “guided analysis” functionality of some BI tools to create parameter-driven reports with user-selected filtering criteria for performing customized analyses. As users gain experience, some of them may even generate their own reports and contribute them to a corporate report library. It’s up to each individual company to determine the approach that works best. In general,

as an organization discovers the benefits of BI, usage is likely to spread quickly throughout the organization. Using commercial BI tools does not mean that your organization has to abandon spreadsheets. Instead, IT needs to establish procedures for proper distribution and control and acquire BI tools that can interface with them.

Setting Policies to Assist Users

At any point in time, your users will range from experts to novices. The IT department can set up and enforce policies as to who can access what reports and who can create their own reports. If your organization is using a commercial software package, popular BI tools such as Crystal Reports may have been bundled with it, and your organization may already have experience using it.

Although some companies have been tempted to avoid commercial BI products by having their IT employees create custom programs for each user request, this approach can quickly overload the IT department with an ever-increasing backlog. Often, companies hire additional IT workers just to keep up with user requests. Most companies that start off writing custom code eventually acquire commercial BI products, if only to enable their IT workers to be more productive and more responsive.

Some companies have even allowed business users to submit their own Structured Query Language (SQL) queries; this usually is nipped in the bud after an incorrectly formulated SQL query results in an answer that’s technically correct but irrelevant to the user. For example, someone requesting a list of employees with salaries greater than \$200,000 and less than \$20,000 is likely looking for both higher-paid and lower-paid employees. However, this list would come up empty since a salary cannot be both over \$200,000 and under \$20,000.

WHAT TO LOOK FOR IN BI PRODUCTS

TOP CRITERIA: INTEGRATION AND EASE OF USE

When selecting business intelligence products, it's important to consider factors besides specific product features. Ease of use, ease of implementation and administration, scalability, user interface options, and how well it integrates into your company's existing and future platform environment – all of these are key considerations.

Key Factors in Product Choice

Look for an integrated product suite, including business management system integration, with a range of functions that your company can deploy as needed. As your company grows, it should not outgrow the capabilities of its BI vendor. In addition, individual users may require different features, and an integrated product suite provides the greatest deployment flexibility. Be sure the product suite offers the scalability to handle an increased user base as your organization grows. As your organization gains experience with BI and its usefulness becomes evident, it's quite likely that its usage will quickly spread.

Data quality functionality is critical to ensure a trustworthy data foundation. High-quality data is a requirement for high-quality decisions, and avoids the problems associated with having "multiple versions of the truth." At the same time, your BI product must be able to access and integrate a wide variety of disparate data sources. Although many companies initially run

their analyses against individual systems, the time will come when data from several sources will be needed to see the total picture. This requires a product suite that includes data integration technology and presents data as if it were located in a single source.

Keeping Options Open

Integration with your desktop software, in particular Microsoft Office, will allow users to complement their BI with familiar desktop tools and reduce your organization's training requirements. In addition, be sure the product can support multiple operating systems, not just Microsoft Windows. This will allow your IT department to keep your future options open and not constrain your organization to a single operating system. Linux is rapidly growing in importance, and your BI products should support it.

Ease of initial installation and deployment is a key consideration, along with the ability to add users quickly; this will increase the productivity of your IT department. Be sure to find out about administration tools, which should be powerful but user friendly. This will allow your IT department to control access and provide a level of security and privacy that's simply not possible in a "spreadsheet only" environment. Your data is an organizational asset that your BI products should protect, while allowing access to those who need it.

Supporting Users

Robust report cataloging and distribution functionality will enable authorized business users to receive their analyses on both an upon-request and periodic subscription basis. The ability to alert users when certain events or value thresholds occur is also important. This will involve delivering reports to desktop and mobile devices, and content must be formatted accordingly.

Finding needed information and locating relevant analyses and reports quickly and easily requires strong search features – a key criterion. Finally, BI tools should allow users to speak in business terms. A product suite with a semantic layer transparently isolates users from underlying technical complexities and allows them to focus on their business issues, not technical software details. For users that need to know the source of data and the underlying formulas (for example, how "gross profit" and "net profit" are computed), data lineage details should also be readily available.

WHAT TO LOOK FOR IN A BI VENDOR

THERE'S MORE THAN MEETS THE EYE

When selecting a business intelligence vendor, many factors figure in. These include the company's experience, reputation, and stability, as well as its professional services capabilities and the quality and strength of its partnerships.

Key Factors in Vendor Choice

One element you might not think of immediately is the vendor's education and training capabilities, but these may be crucial to your ability to introduce the new technology smoothly. While many vendors offer on-site and in-house training, a few have developed self-paced, computer-based training that can assist new users in getting started or help experienced users master advanced product features quickly.

Select a vendor with a proven record of accomplishment and a history of successful growth – both in revenues and capabilities. Solid growth and profitability indicate both astute management and product acceptance, as well as the ability to serve customers well and invest in the future. Choose a vendor that's large enough to retain its independence. A history of acquiring and successfully integrating complementary technology is another good sign. This company is more likely to be able to react quickly to new market demands and to supply the technology your company needs. And a vendor that can demonstrate vision, innovation, and industry leadership is one that may well be able to anticipate its customers' future requirements.

Thinking Ahead

As BI usage increases, it's likely that your organization will deploy it against additional systems and databases. While a database vendor may offer its own proprietary BI technology, what happens when your organization decides to use another database? A major advantage of choosing a BI specialist is its ability to work with a wide variety of data sources.

Consider the vendor's product delivery options. While many vendors will only allow you to license their products to run on your company's servers, others also provide "on-demand" or software as a service (SaaS) options. Here, the vendor hosts the software on its own servers and enables customers to use it through their Web browsers. The SaaS model can be especially appealing to small companies that wish to minimize up-front startup costs, with the option to bring the software in-house when it makes economic sense.

Preparing for Growth

A vendor with a large cadre of partners – both software vendors and consultants – will prove invaluable. One measure of "openness" is the number of other software products that a BI tool works with. A vendor that actively encourages partnerships is likely to have little problem integrating its technology with your current and future software environments. Vendors with a strong base of consulting partners make it easier to find outside expertise should your organization have special requirements. Further, a product set

that works in both operational systems and data warehousing environments will provide your organization with maximum deployment flexibility and support a strong growth path.

Finally, keep in mind that your organization will likely grow and expand. It may not be a giant today, but it could be one tomorrow. Choose a vendor that has successful and extensive experience with organizations of all sizes. And if you expect to operate on an international scale someday, a vendor with a multinational presence is highly desirable.

CONCLUSION

IMPROVED ANALYSIS FOR MORE EFFECTIVE BUSINESS DECISIONS

Managers have the responsibility to make the best decisions possible, based upon the data available to them at the time. If their ability to analyze this data and transform it into useful information is improved, the overall quality of their decisions will improve as well.

Business intelligence provides a spectrum of tools and solutions to support this aim. It's the underlying technology behind more effective decision making. By helping align individual and departmental efforts with overall corporate strategies, it should lead to improved organizational results.

While many small and midsize companies have relied on spreadsheets as their primary BI tool, most of them have come to realize that this is a stopgap solution. This is not to say that spreadsheets should be abandoned; rather, they should be a part of an organization's BI tool set. The key is to choose the right commercial BI product suite that integrates with spreadsheet environments while supporting your long-term growth.

For More Information

To learn more about how products from SAP and Business Objects, an SAP company, can support your business intelligence initiatives, please call your SAP representative, or visit www.businessobjects.com/product/platforms/midmarket.asp.

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