

## BUSINESS INTELLIGENCE SOLUTIONS FOR SAP

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By Philip Russom



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### About the Author



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### About TDWI

The Data Warehousing Institute, a division of 1105 Media, Inc., is the premier provider of in-depth, high-quality education and training in the business intelligence and data warehousing industry. TDWI is dedicated to educating business and information technology professionals about the strategies, techniques, and tools required to successfully design, build, and maintain data warehouses. It also fosters the advancement of data warehousing research and contributes to knowledge transfer and the professional development of its Members. TDWI sponsors and promotes a worldwide Membership program, quarterly educational conferences, regional educational seminars, onsite courses, solution provider partnerships, awards programs for best practices, resourceful publications, an in-depth research program, and a comprehensive Web site ([www.tdwi.org](http://www.tdwi.org)).

### About TDWI Research

TDWI Research provides research and advice for BI professionals worldwide. TDWI Research focuses exclusively on BI/DW issues and teams up with industry practitioners to deliver both broad and deep understanding of the business and technical issues surrounding the deployment of business intelligence and data warehousing solutions. TDWI Research offers reports, commentary, and inquiry services via a worldwide Membership program and provides custom research, benchmarking, and strategic planning services to user and vendor organizations.

### Acknowledgments

TDWI would like to thank many people who contributed to this report. First, we appreciate the many users who responded to our survey, especially those who responded to our requests for phone interviews. Second, our report sponsors, who diligently reviewed outlines, survey questions, and report drafts. Finally, we would like to recognize TDWI's production team: Jennifer Agee, Bill Grimmer, Denelle Hanlon, Deirdre Hoffman, and Susan Stoddard.

### Sponsors

Business Objects, Cognos, HP, IBM, Microsoft, MicroStrategy, SAP, and Teradata sponsored the research for this report.

## Research Methodology and Demographics

**Report Scope.** This report is designed for technical executives who wish to understand the many options that are available today for building or buying a business intelligence solution for an SAP-centric organization. The report describes the business reasons for taking certain approaches, as well as the technical requirements for them. It includes a summary of vendors and products that enable BI for SAP applications and data.

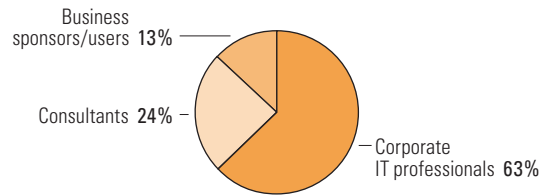
**Survey Methodology.** This report's findings are based on a survey run in 2007, as well as interviews with data management practitioners, consultants, and software vendors. In May 2007, TDWI sent an invitation via e-mail to the data management professionals in its database, asking them to complete an Internet-based survey. The invitation also appeared on several Web sites and newsletters. A total of 294 people completed all of the survey's questions. From these, we excluded the 16 respondents who identified themselves as academics or vendor employees, leaving the completed surveys of 278 respondents as the data sample for this report.

TDWI also conducted telephone interviews with numerous technical users and their business sponsors, and received product briefings from software vendors with products related to BI for SAP users.

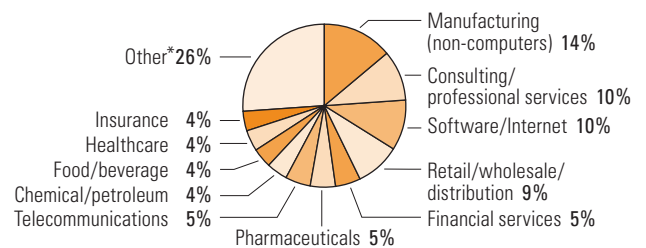
**Survey Demographics.** The wide majority of survey respondents are corporate IT professionals (63%); the rest consist of consultants (24%) or business sponsors/users (13%). The broad majority of survey respondents have experience with data warehousing. Note that the survey presented questions about using SAP only to respondents who identified themselves as SAP users. Therefore, market statistics drawn from these questions accurately portray BI usage in organizations that have deployed SAP products.

Manufacturers dominate SAP's customer base, so it's no surprise that this industry dominates the respondent population (14%). The consulting and software industries trail (with 10% each), followed by retail, financial services, pharmaceuticals, and telecommunications (with 5% each). We asked consultants to fill out the survey with a recent client in mind. By far, most respondents reside in the U.S. (61%) and Europe (16%). Respondents are distributed across companies of all sizes, though they are more numerous in companies with \$1 billion or greater of annual revenue.

### Position

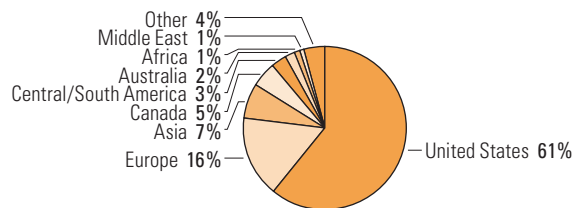


### Industry

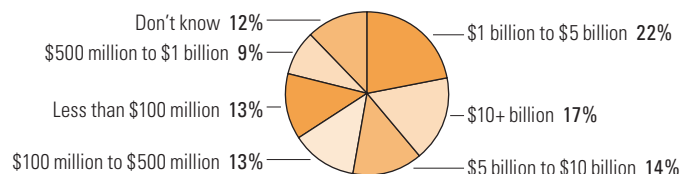


\*The "other" category consists of industries with less than 4% of respondents.

### Geography



### Company Size by Revenue



Based on 278 Internet-based respondents.

### Executive Summary

Providing business intelligence (BI) solutions for a business that uses SAP software continues to confound many users because of the long list of available options and the inherent complexity of such an undertaking. Yet, organizations need to clear these hurdles so they can benefit from a BI solution that provides visibility into business processes supported by applications from SAP and other vendors. This isn't a new issue, but SAP customers need to revisit their BI solutions for SAP now, because many are old and need updating. In addition, new products and releases—from SAP and other vendors—have introduced more BI tool options.

The early sections of this report help SAP users understand the inherent challenges and available solutions for BI. Later sections discuss common use cases where SAP and non-SAP products are applied to successful BI solutions.

The SAP-centricity of a BI solution for SAP is a matter of degree. In other words, a BI solution for SAP may incorporate SAP applications data only, or it may also integrate data from other applications (and even nonapplication sources, like syndicated data). The latter is necessary for a complete view of organizational performance. In fact, gaining a centralized “single version of the truth” is one of the reasons organizations deploy enterprise data warehouses. At the other extreme, the data requirements of some BI solutions can be satisfied straight from application data without a data warehouse. The challenge is to satisfy both application-specific and enterprise-scope BI requirements.

This challenge is at the heart of most decisions SAP users make when selecting reporting and analysis tools, designing data warehouse architecture, and building data integration routines. Any solution that addresses both application-specific and enterprise-scope BI will affect many business units and IT systems, so all their users, owners, and sponsors should be involved in these cross-functional decisions. In some cases, however, upper management within the SAP user company selects SAP as a preferred provider of software—including BI software. Selecting a preferred supplier is a good procurement practice, in general, but potentially dangerous for BI solutions when the strategy precludes cross-functional collaboration and ignores user requirements.

Every BI solution—whether involving SAP or not—includes a technology stack with layers for reporting and analysis tools, data warehouse platforms, and data integration tools. Note that TDWI applies the term *BI* to the entire technology stack, not just the layer for reporting and analysis tools. BI products from SAP and other vendors map directly to these layers.

For example, for the reporting and analysis layer of the stack, the majority of SAP customers use BI products from the SAP NetWeaver BI product family. But they also use, on average, two reporting and analysis tools from other vendors. Areas where SAP users turn to third-party tools include enterprise reporting, predictive analytics, and advanced visualization. Likewise, most SAP users have deployed the data warehouse component of SAP NetWeaver BI, formerly referred to as SAP Business Information Warehouse (SAP BW). But most SAP BW users have at least one non-BW data warehouse platform, and a few have two. And SAP infrastructure includes so-called standard extractors for moving data among SAP components, although many SAP users turn to data integration tools from other vendors for integration that reaches beyond the SAP environment. The point is that SAP users are voracious in tool consumption across the entire BI technology stack: they generously use different types of BI products from SAP and many other vendors.

## Overview of Business Intelligence Solutions for SAP

SAP is the world's largest provider of packaged applications for enterprise resource planning (ERP), customer relationship management (CRM), and supply chain management (SCM). The majority of its 38K+ customers complement these applications with various forms of business intelligence (BI). Yet, deciding how to approach BI in an SAP environment has its challenges. First, there's a dizzying array of BI solutions available from SAP, third-party software vendors, external consultants, and in-house IT through custom development. Then, there's the SAP ERP environment itself, a mature and feature-rich platform that has many options for accessing, integrating, and presenting data. And—even in companies that rely on SAP more than any other platform—there are inevitably other systems that must tie into the BI solution.

Hence, providing BI solutions for a business that uses SAP software continues to confound many users, due to the long list of available options and the inherent complexity of such an undertaking. Yet, organizations need to clear these hurdles so they can benefit from a BI solution that provides visibility into business processes enabled by SAP applications and others.

This report helps SAP users understand the inherent challenges and available solutions for BI. It describes the many options SAP users have for BI, with a focus on identifying those that are best suited to specific situations. Much of the information presented here comes from interviews with data management professionals as well as a survey of hundreds of users. This report will discuss what works in terms of technology, as well as the business impacts of combining BI tools with SAP applications.

Many organizations have yet to deploy a meaningful BI solution for their SAP applications and data, and this report can get them started. For organizations that already have such a solution in place, this report explains what has changed recently and how BI solutions for SAP evolve over time. The intended audience includes business and technical executives, managers, and developers responsible for approving and building BI initiatives that involve SAP products like SAP ERP (and its predecessor SAP R/3), SAP CRM, SAP NetWeaver BI, and SAP NetWeaver Portal. Even so, many of the business and technology issues discussed here apply to BI with any packaged application.<sup>1</sup>

### Why Should SAP Users Care, and Why Now?

This isn't a new issue. Selecting a BI strategy for SAP applications and data is a 15-year-old problem. But there are good reasons why SAP users need to revisit their BI solutions today:

- **SAP's BI offering has improved in recent years.** The four key functional areas for BI from SAP—the data warehouse (formerly called BW), Business Explorer (BEx), master data management (MDM), and SAP Portal—have all seen incremental improvements. More significant, however, is that SAP has begun to consolidate its BI and integration products into a product line called NetWeaver BI, which is part of a larger product family called NetWeaver. More than a name change, the larger NetWeaver product family has deepened interoperability between SAP and non-SAP environments, plus added more functionality and usability for BI solutions, which TDWI sees as a step forward for BI users. In addition, SAP launched an in-memory analytic engine, the SAP NetWeaver BI Accelerator, which enhances BI system performance.
- **Third-party products for BI with SAP have improved, too.** Many of these products have supported interfaces to SAP ERP since the late 1990s, which means they are now mature,

**Selecting a BI solution for SAP applications and data confounds users.**

**This report sorts out the approaches and tools required of an SAP-centric BI solution.**

<sup>1</sup>For a discussion of BI for packaged applications from a variety of vendors, see the TDWI Best Practices Report *Developing a BI Strategy for CRM/ERP Data*, available online at [www.tdwi.org/Research/ReportSeries](http://www.tdwi.org/Research/ReportSeries).

feature-rich, and robust. Many go beyond base-level integration by providing packaged BI solutions that consist of data models, data integration mechanisms, and bodies of reports specifically for SAP users.

- **Application consolidation is a popular IT project this decade.** Companies are cleaning up the rampant application deployments of the 1990s by consolidating into fewer brands of packaged applications, as well as consolidating into fewer instances of application brands that are considered corporate standards. This affects a BI solution, whether it's a departmental deployment focused on application data or an independent enterprise data warehouse (EDW).
- **Mergers and acquisitions are on the rise.** As TDWI discovered in user interviews, some companies see mergers as opportunities to kill off nonstandard applications and replace them with standard ones from large vendors like Microsoft, Oracle, and SAP. In a ripple effect, the standardization causes changes in BI solutions.
- **Application life cycles demand new or updated BI solutions.** The SAP customer base is growing, which is driving up the need for new SAP-centric BI solutions. Furthermore, packaged applications have been around long enough now that many implementations have outgrown their existing BI solution and now demand an update that provides richer reporting and analysis options for end users, support for larger user communities, and broader data integration from across the enterprise beyond the packaged application.

### Definitions of Terms and Concepts

Let's step back for a moment and define how key terms and concepts are applied in this report.

**Enterprise resource planning (ERP).** A suite of software applications where each provides automation for a back-office task such as manufacturing, supply chain management (SCM), financials, and human resources (HR). The ERP suite may also include applications for front-office tasks such as sales, marketing, call center, and customer relationship management (CRM). Back-office and front-office applications together are sometimes called "operational applications," since they constitute the operations of a firm. ERP or operational applications can be built by IT or consulting personnel or bought from a software vendor. Those from vendors are often called "packaged applications." Leading vendors of packaged applications for ERP and similar tasks like CRM include Microsoft, Oracle, and SAP.

**Business intelligence (BI).** TDWI defines BI as the tools, technologies, and processes that help turn data into information and information into rules and plans that optimize decision making and business activity. Note that the definition encompasses both technology and business process. Business activities like decision making are the goal, and the technology supports or enables this goal. Also note that TDWI usually applies the term BI to describe the entire technology stack—including data integration, the data warehouse environment, and front-end tools for reporting analysis. But BI could also be the reporting and analysis layer of the stack, alone. This report uses the term BI in the sense of the total technology stack.

**BI Solution for SAP.** Any BI software solution that involves data from SAP applications. Such solutions can be simple or complex, and may be home-grown or enabled by products from SAP and other vendors. The scope of a BI solution for SAP can vary greatly; at one extreme, it may provide reports for SAP-supported processes only, whereas at the other extreme it may be a subset of

a much larger and independent enterprise-scope BI solution. A full-blown BI solution will include technology layers for data integration, data warehousing, and reporting/analysis tools, or it may provide a subset of these.

**SAP-centric business.** An organization that automates most of its business processes with SAP applications. According to a VP of BI that TDWI interviewed: “We quantified it, so I know that 81% of business processes are automated by SAP applications.” A similar appraisal came from a data access specialist at a large manufacturer: “We estimate that 75% of our transactional business is done through SAP application modules.”

SAP-centric businesses often get that way by first selecting SAP AG as a priority vendor for software solutions. “This is definitely an SAP-centric business, and it will get more so as we decommission our mainframe, replacing it with SAP applications,” said a VP of BI. “SAP is a preferred supplier, by executive mandate. If 80% of business requirements are satisfied by an SAP product, then we’re obligated to use that product instead of one from another software vendor.”

#### **USER STORY**

**SAP is a preferred software supplier for many of its customers.**

## **Vendor Products for BI with SAP Applications and Data**

As an introduction to the vendor products available for BI solutions for SAP, let’s consider how BI products from SAP and other vendors map to the BI technology stack.

### **NetWeaver BI**

SAP NetWeaver Business Intelligence—or NetWeaver BI—is a packaged BI solution built and sold by SAP AG. It includes reporting and data analysis tools, planning and simulation capabilities, portal technology, a packaged data warehouse, and extractors for data integration.

Among NetWeaver BI’s components, the one of greatest interest to BI professionals is the packaged data warehouse facility, which SAP has, in the past, called Business Information Warehouse or simply BW. Most users continue to refer to it as BW, although it’s now a component within the NetWeaver BI product group. SAP infrastructure supports hundreds of extractors that can extract transactional data and master data from SAP ERP and some non-SAP sources, then load it into SAP NetWeaver BI.

Also of interest is Business Explorer (BEx), a suite of end user tools for reporting and data analysis. Two of these tools are commonly used by SAP users: BEx (a plug-in for Microsoft Excel) and BEx Web (a browser-based front end that’s in spreadsheet style). Also, SAP Visual Composer is an application development tool with which some users create reports in dashboard style, featuring Adobe Flash rendering. And some users deliver reports and dashboards via SAP’s portal. Finally, planning capabilities are built into the platform, and the SAP NetWeaver BI Accelerator enhances BI system performance.

### **Layers of the BI Technology Stack**

Every BI solution—whether involving SAP or not—includes a technology stack with four primary layers, one each for data sources, data integration tools, data warehouse platforms, and reporting and analysis tools. The flow of data—from the first to the fourth—holds the stack together. (See Figure 1.) Although there’s some overlap and interaction between layers, each tends to have its own best practices and enabling technologies, such that designing a stack involves selecting tools, platforms, applications, and practices for each layer, as well as determining how all these will interoperate to constitute a unified stack.

**The BI technology stack has four primary layers.**

The TDWI BI Technology Stack

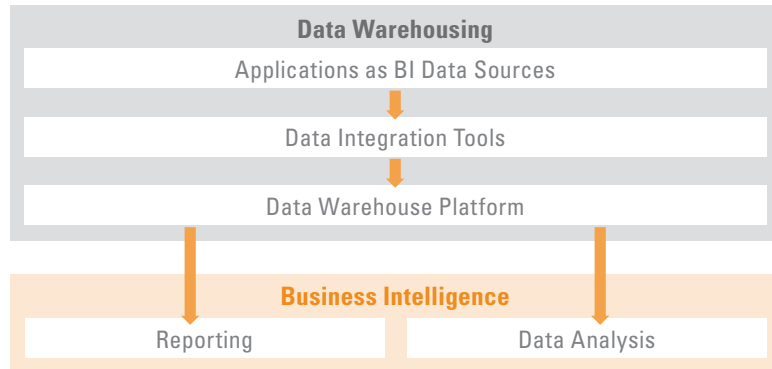


Figure 1. Different best practices and vendor products apply to different layers of the stack.

Every BI solution for SAP has at its heart a basic BI technology stack. Later sections of this report will drill into each layer of the stack to discuss its critical success factors and to list some of the products, from SAP and other vendors, appropriate to it. In the meantime, here’s an overview of how the layers of the basic BI technology stack map to SAP-related issues and products.<sup>2</sup>

**BI solutions for SAP have four primary layers, like all BI solutions.**

- **Reporting and analysis tools.** SAP products for this layer include BEx, Visual Composer, and SAP Portal. Enterprise-scope reporting and analysis tools that support SAP are available from vendors like Actuate, Business Objects, Cognos, Hyperion (Oracle), Information Builders, Microsoft, MicroStrategy, and SAS Institute.
- **Data warehouse platforms.** NetWeaver BI includes BW, which is SAP’s packaged data warehouse. Some organizations design and build their own unique data warehouses based on platforms from HP, IBM, Microsoft, Netezza, Oracle, Sybase, and Teradata.
- **Data integration tools.** NetWeaver BI’s standard extractors can move and integrate data within the SAP environment and beyond to some non-SAP data sources. But some SAP users use enterprise data integration tools from vendors like Business Objects, Composite, Information Builders, IBM, Informatica, Microsoft, and SAS. SAP NetWeaver MDM provides integrated data quality functions, while a few SAP customers use data quality tools from vendors like Business Objects, DataFlux, IBM, and Trillium.
- **Applications as BI data sources.** Data sourcing requirements for reports and data warehouses have a strong influence on the design of a BI solution for SAP. This is because data may come from SAP applications, non-SAP applications, or a mix of these and other sources, which sometimes requires a mix of SAP and non-SAP BI products.

**SAP Certifications**

The preceding lists demonstrate that BI products from many vendors may be integrated into a BI solution for SAP. To enable integration with third-party products, SAP provides a number of interfaces. To assure that third-party products interoperate correctly with SAP products, SAP offers integration and certification services.

Most vendors’ BI products are certified for integration with one or more SAP products or interfaces. For example, most reporting and data analysis tools are certified for accessing data in NetWeaver BI

<sup>2</sup> Vendors and products mentioned here are representative, and this report does not attempt to be a comprehensive description of the entire vendor community. Based on the products mentioned in this report, a technical user should be able to identify user requirements, understand what combination of tools and technologies are needed, and draft an evaluation list of vendor products that map credibly to user requirements.

(BW) and for delivering reports into NetWeaver Portal. Data integration tools are usually certified for accessing data in SAP ERP (SAP's ERP infrastructure), since this is where the source data for BI resides; they may also be certified to load data into BW. "Powered by NetWeaver" is a relatively new and special certification. To qualify for this certification, a third-party product must support NetWeaver's enterprise service-oriented architecture (SOA) interfaces.

Certifications from SAP are important for several reasons:

- **Quality assurance.** Certification proves that a non-SAP product supports an SAP interface and/or interoperates with an SAP product reliably.
- **Information security.** Using certified products in the intended way forces access through SAP NetWeaver BI's security level, which assures information security and data integrity.
- **Effective support and upgrades.** Leveraging certified interfaces leads to straightforward upgrades and effective support from SAP and its partners.
- **Confidence building.** Certification tells SAP customers that they can use a certified third-party product safely and in a manner consistent with how SAP products work.
- **Relationship building.** Certification can lead to a relationship and possible partnership between a third-party vendor and SAP, which yields more product options for users.
- **Product innovation.** Certification has helped SAP and many third-party vendors expand their product functionality into new areas, most recently data quality and SOA.

Certification by SAP is an excellent starting point. SAP users should demand certification from non-SAP vendors, but don't stop there. Be sure to use certified products in the manner for which they were certified. Also check each vendor's references and test carefully to assure that product combinations work as advertised. Furthermore, SAP's certification criteria for BI products tend to be basic, usually just requiring a connection and a data transfer between SAP and a third-party product. This is a good place for a third-party vendor to start with SAP support, but the vendor should look for ways to add value above and beyond certification. So, when evaluating third-party tools, SAP customers should look for certifications, but also SAP-specific value—as well as general BI value—beyond the certification.

## Issues that Influence BI Solutions for SAP

The issues discussed here quantify the state of BI solutions for SAP, but also describe the issues you need to consider before deciding which mix of tools, platforms, approaches, professional services, and business sponsorship are appropriate to your solution.

### Applications and Data Warehouse Architecture Issues

Most of the data that populates data warehouses and reports comes from various types of operational applications, including those for ERP, CRM, and SCM. Because these are prominent sources of data that BI is based on, the number and diversity of applications strongly influences the data content and architecture of any BI solution, especially those that involve SAP.

- **SAP users don't only use SAP applications.** TDWI's survey asked, "From which vendors has your organization acquired packaged applications for ERP and other operations?" The

survey population is dominated by SAP users, so it's not surprising that 71% of respondents report using SAP applications. (See Figure 2.) But many reported also acquiring applications from Oracle (25%), Peoplesoft (24%), Siebel (15%), JD Edwards (12%), and so on. Given the numerous vendors selected by survey respondents—plus home-grown solutions—it's safe to say that most SAP-centric businesses also have significant non-SAP applications.

**Deciding how close to an application its BI data should reside affects data warehouse architecture.**

- **The SAP-centricity of your BI solution is a matter of degree.** In other words, a BI solution for SAP may incorporate SAP applications data only, or it may also integrate data from other applications (and even non-application sources like syndicated data). The latter is necessary for a complete view of organizational performance. In fact, gaining a centralized “single version of the truth” is one of the reasons organizations deploy enterprise data warehouses. The challenge is to satisfy both application-specific and enterprise-scope BI requirements.
- **Application diversity may lead to BI solution diversity.** This may mean deploying both NetWeaver BI and an enterprise data warehouse (EDW). In most cases, NetWeaver BI supports data marts and reports specific to businesses and processes supported by SAP applications, whereas the EDW collates information from many sources for strategic decision making. To reduce the number of solutions, some SAP-centric organizations have made NetWeaver BI the equivalent of an EDW, while others rely on an EDW without any SAP BI products. Selecting one of these data warehouse architectures—or a combination of them—is a tough decision for SAP users, because it affects the cost of BI, completeness of data content, data ownership, and how BI goals are prioritized (i.e., tactical operations versus strategic planning).

From which vendors has your organization acquired packaged applications for ERP and other operations? (Select all that apply.)

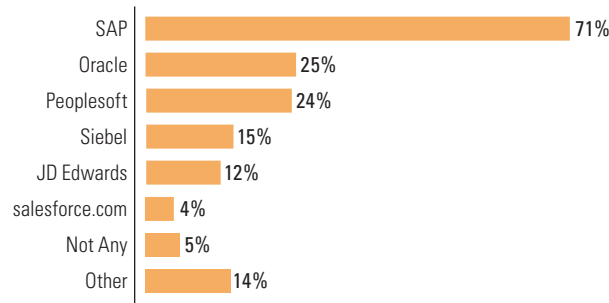


Figure 2. Based on 476 responses from 278 respondents. Average responses per respondent: 1.7<sup>3</sup>

### Organizational Issues

TDWI asked of SAP users: “Is the BI environment for SAP the same as your enterprise BI environment?” (See Figure 3.)

- **Enterprise-scope BI.** Over half (56%) said “yes,” which suggests that these respondents’ BI infrastructure is enterprise in scope—that is, it spans the data and BI needs of many applications and business units, not just those associated with SAP applications.
- **Application-scope BI.** Roughly one-third (37%) said “no,” suggesting these users have a BI solution that is narrowly focused on the data and business processes of SAP applications.

<sup>3</sup>Survey respondents who selected “Other” entered the names of their application providers, including (in descending order by number of responses) Microsoft (Great Plains), Lawson, Manugistics, i2, Bann, Hyperion, Retek, and Epicor.

Of course, this does not preclude them from also having a separate BI solution of enterprise scope.

- **Determining scope is an important BI design decision.** A BI solution for SAP may be enterprise scope, with SAP-specific requirements satisfied by a subset of the solution. Or it may be application scope, possibly complemented by an enterprise-scope BI solution.

The scope of a BI solution for SAP is related to its ownership and sponsorship. (See Figure 4.)

- **Line-of-business managers (44%) commonly sponsor BI solutions for SAP.** Line-of-business managers often fund, own, and sponsor operational applications, so it's possible that they have extended this role to also sponsor application-specific BI. Even so, IT and BI directors sponsor BI solutions for SAP just as often (45%).
- **SAP BI sponsorship can also be shared.** Several survey respondents selected "Other" and entered comments like "we use a team approach, no single sponsor." Sponsorship is "shared by all businesses" where it involves "several stakeholders." Or BI may be sponsored by "corporate leadership as part of the SAP implementation."
- **Finance departments often sponsor BI, whether for SAP or not.** We're reminded of this by survey respondents who listed their finance organization or its CFO, VPs, and directors.

Is the BI environment for SAP the same as your enterprise BI environment?

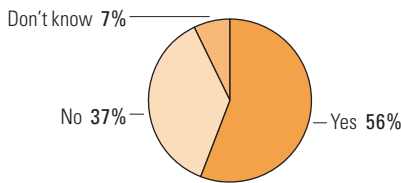


Figure 3. Based on 172 respondents who are SAP users.

Who's the primary sponsor for your BI solution for SAP?

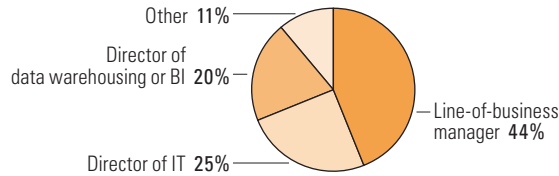


Figure 4. Based on 172 respondents who are SAP users.

What strategy has your organization followed in acquiring ERP applications?

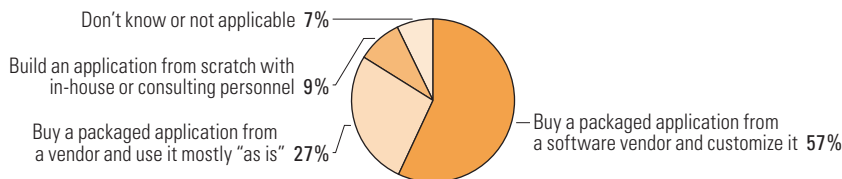


Figure 5. Based on 278 respondents who use applications from SAP and other vendors.

Which best describes how you built your BI solution for SAP?

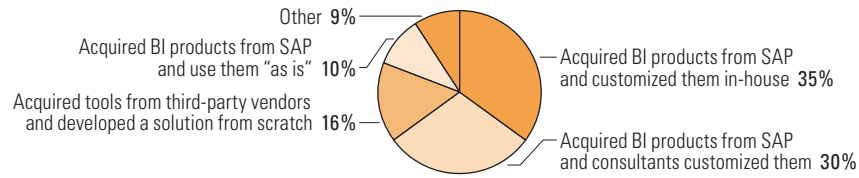


Figure 6. Based on 172 respondents who are SAP users.

**Build versus Buy Issues**

When it comes to ERP applications and the classic build-versus-buy decision, buying is the norm by a long shot, with most survey respondents buying and customizing (57%), followed by those who buy but don't customize much (27%). (See Figure 5.) By comparison, building an ERP system is rare (9%). This is natural, given the complexity of ERP processes and how difficult it would be to build and maintain an application to automate them. Plus, multiple software vendors offer mature ERP systems that are feature-rich, robust, and have solid track records.

**Most SAP applications customers use SAP BI products.**

To quantify the build-versus-buy approaches of BI solutions for SAP, TDWI's survey first identified respondents who are SAP users, then asked them: "Which best describes how you built your BI solution for SAP?" (See Figure 6.) A whopping 75% reported acquiring BI products from SAP, which is a high penetration of BI products for an applications vendor.

Note that the level of customization varies with SAP BI products. Relatively few use SAP BI products "as is" (10%), while most assign in-house personnel (35%) or hire consultants (30%) to customize them. Customization has ramifications for packaged solutions:

- **BI solutions are hard to package.** That's because an organization's BI data sources, its data models, and its report presentations all vary tremendously. However, if you narrow the scope of the BI solution to specific use cases, which SAP NetWeaver BI does by focusing on standard business processes, the breadth of user requirements is reduced, thereby reducing the difficulties of packaging a solution that works for multiple user organizations. But BI requirements still vary somewhat, even when focused on ERP, so organizations inevitably customize to some degree.
- **The greater the customization, the greater the difficulty of upgrading.** Some SAP customers would like to upgrade from older BW releases to recent NetWeaver BI ones, but they feel that customization makes the upgrade too difficult to attempt. Let's all recognize that customization is inevitable with BI products, so upgrades usually involve development work.
- **Avoiding customization reduces project time and cost.** A tried-and-true strategy for a packaged solution is to roll out the first phase with little or no customization, then tailor the solution to organizational requirements in subsequent phases.

**USER STORY**  
**SAP BW can be quick to implement.**

"We started our implementation of SAP BW in 2002, working in parallel with the firm's implementation of the SAP ERP," said Brian Hickie, former VP of Business Intelligence at McKesson Pharmaceutical. "We only had nine months to implement the data warehouse, along with considerable ETL jobs and a number of initial analytics and reports. We made the deadline

despite the fact that the SAP ERP configuration precluded the use of standard business content or standard data extractors; the ETL jobs and BW required a considerable amount of configuration to provide the data to generate analytics and reports from the ERP and legacy systems.”

Developing home-grown BI solutions isn't as common as other approaches in Figure 6 (16%). However, other survey questions showed higher rates, and survey respondents who selected “Other” entered responses that involve home-grown solutions:

- **SAP BW and EDWs can coexist peacefully.** Some BI solutions for SAP involve both NetWeaver BI (specifically the BW component) and an independent enterprise data warehouse (EDW). For example, one survey respondent said: “We both use BW and extract SAP data into a data warehouse.” Another reported using “BW and an in-house solution based on Oracle and Business Objects,” while yet another said, “[We] use SAP BI as an OLAP tool to access a Teradata EDW.”
- **Some BI solutions for SAP are a work in progress.** As one survey respondent put it, “We’re in transition from a legacy custom-developed EDW to SAP BI.”

## Issues in Software Acquisition Strategies

TDWI asked of SAP users taking this report’s survey: “What was the primary reason for your organization’s implementation of a BI solution for SAP?” In the survey, the question had no pre-written answers to select; instead, each respondent typed an answer in his/her own words. Many respondents turned the question into a soapbox, because they have strong feelings either for or against SAP as a preferred software supplier and how that predetermines the products they use.

**Using SAP BI products is often a foregone conclusion, once the organization is using SAP applications.**

- **For many organizations, naming SAP a priority supplier leads inevitably to SAP BI products.** Some respondents stated this in matter-of-fact answers like: “SAP is our preferred provider in all areas.” Others made a direct causal link: “Using SAP ERP was the main driver to start with an SAP BW solution” and “SAP is selected as our common platform, which includes BW.”
- **Some spoke of the positive leverage between NetWeaver BI and SAP ERP:** “BW is a good fit on top of SAP ERP and SAP CRM,” enabling users “to leverage prebuilt content and integration with the ERP.” According to other survey respondents: “Most of our [BI] information is sourced from SAP components,” and “BW provides a direct link to primary source data.”
- **A few people complained about the SAP-centric strategy.** One claimed that using SAP BI products is due to a “strategic decision to use SAP overall, even when it does not fit.” Others received SAP BI products due to management actions beyond their control: “It [NetWeaver BI] was paid for in an overall package of software” and “parent company purchased SAP solutions.” Selecting a preferred supplier is a good procurement practice, in general, but it’s frustrating for IT professionals when the strategy doesn’t consider user requirements.
- **Most mentioned the usual benefits of BI as reasons for implementing a BI solution.** Several listed common BI goals like better decision making or improved corporate performance. Others cited specific BI needs like financial reporting, datasets for business analysts, or operational reporting based on SAP ERP source data.

**EXPERT COMMENT**  
**Leverage what you have instead of reinventing the BI wheel.**

“All of my clients have multiple application modules from SAP, and for most of them, that’s a good enough reason to get their BI technology from SAP,” said a consultant who specializes in BI solutions for SAP. “Why bother with an independent data warehouse? BW infrastructure—especially with recent NetWeaver releases—is almost identical to what you’d build into an independent warehouse. So the common practice I see is to leverage what you already have, instead of reinventing the BI wheel. Also, my clients trust SAP as a large, stable, non-acquirable vendor. In terms of best of breed, other BI and data integration tools are better, but SAP’s offering is relatively complete and pretty good. And the direct integration between BI and ERP is hard to beat.”

**USER STORY**  
**Experienced DW professionals can be skeptical about SAP NetWeaver BI.**

“We have a mature, best-of-breed technology stack for data warehousing and business intelligence, but it’s currently at risk because our company’s being acquired by a company with a deep commitment to SAP applications and BI,” said an enterprise data architect. “We’re under pressure to abandon our EDW and go with SAP NetWeaver BI, but we’re not sure it will meet our requirements for strategic and financial reporting, much less scale up. The merger is barely under way, and we’ve just started investigating NetWeaver, so it’ll be a long time before we know which way to go.”

## Reporting and Analysis Options

Now that we’ve explored background issues with BI solutions for SAP, let’s look at some of the available options for reporting and analysis practices and tools.

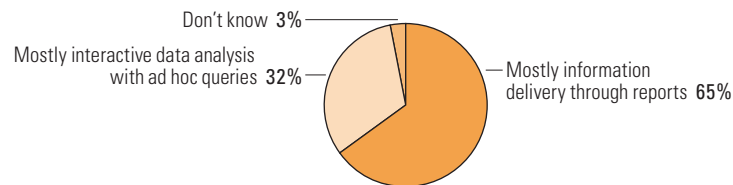
### Reporting and Analysis Practices

TDWI asked SAP users, “Which statement best describes what your BI solution for SAP does?” (See Figure 7.) Roughly two-thirds said their solution is “mostly information delivery through reports,” while one-third said it’s “mostly interactive data analysis with ad hoc queries.”

Compared to the broader BI landscape (not just SAP users), the stress on information delivery is fairly normal, since most organizations depend heavily on data presented in static reports. However, the one-third of surveyed users giving priority to data analysis suggests that BI solutions for SAP have a healthier data analysis purpose than the average BI solution. The slightly higher stress on data analysis may be due to the nature of ERP. After all, planning resources demands analysis and forecasting, not just management, and this affects BI solutions centered on ERP.

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Which statement best describes what your BI solution for SAP does?



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Figure 7. Based on 172 respondents who are SAP users.

What types of reports and analyses does your BI solution for SAP support? (Select all that apply.)

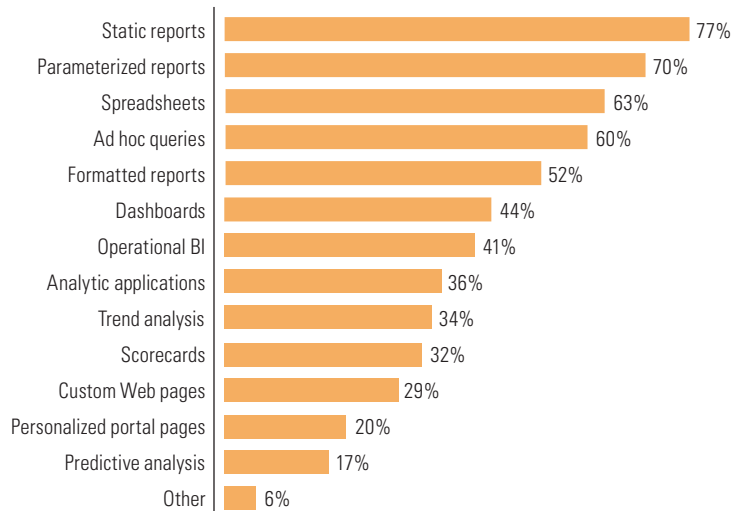


Figure 8. Based on 998 responses from 172 respondents who are SAP users. Average responses per respondent: 5.8.

SAP users employ numerous types of reports and analyses. In Figure 8, the number of responses per respondent averages almost six, which indicates a diverse range of report types.

- **Static and parameterized reports are the bread and butter of any BI solution.** So it's no surprise that static reports (77%) and parameterized reports (70%) top the survey results.
- **Spreadsheets are common in BI, including BI solutions for SAP.** Finance directors, sales managers, and similar business folks work with spreadsheets daily, and so are productive with them. Some of these folks want to achieve similar productivity in BI by using spreadsheet-based reporting and analysis tools.
- **SAP users value data analysis.** Sixty percent of survey respondents said their solution includes ad hoc queries, as well as analytic applications (36%) and trend analysis (34%).
- **SAP users are adopting the BI methodology called performance management.** And it's usually manifested in reports in the style of dashboards (44%) or scorecards (32%).
- **SAP users are starting to deliver reports over the Web.** Twenty-nine percent of survey respondents employ custom Web pages, whereas 20% use personalized portal pages.

“Our management needed a dashboard-based performance management application, so we built one using BEx Web, Visual Composer, SAP Enterprise Portal, and BW,” said the BI director at a specialty product company. “The top level presents 10 key performance indicators, refreshed monthly for senior management. Below that, dashboards cover more tactical metrics that are refreshed more frequently, including daily refreshes for sales dashboards. Operational reports supply detailed data, and most of these can be refreshed on demand. Some users, like business analysts, can drill down from a metric into a cube or detailed source data. Across all these, the business focus is on revenue and profitability.”

**USER STORY**  
**Performance management can be SAP-centric.**

## Reporting and Analysis Tools from SAP and Third-Party Vendors

SAP AG offers several components within SAP NetWeaver that can be applied to a BI solution. For a list, see Figure 9, where the average number of responses per respondent is almost three, which suggests that SAP customers on average use three SAP NetWeaver BI products.

- **BEx and BEx Web embrace the desire for spreadsheets.** SAP Business Explorer (BEx) comes in two forms: BEx is a plug-in that makes Microsoft Excel the end user BI tool, whereas BEx Web is a browser-based front end. Both BEx products embrace business people's preference for spreadsheets by providing a spreadsheet-based approach to both reporting and analysis. These are popular tools among SAP users, and they top the survey results in Figure 9. Sixty-five percent of SAP users surveyed use the BEx plug in, while 49% use BEx Web. Note that BEx plug-in for Microsoft Excel is more common than the newer BEx Web, which imitates an Excel environment. As one user that TDWI interviewed put it: "We tried BEx Web, but our users prefer real Excel, so we went back to Excel with SAP's BEx plug-in."
- **SAP Enterprise Portal is important to BI solutions for SAP.** That's because of its prominent role in three key scenarios. First, reports created with SAP BI products—especially BEx Web and Visual Composer—can be presented to report consumers through the portal, along with a wide variety of corporate content. Second, reports created with another vendor's BI product can be presented via the portal, as long as the third-party product supports the appropriate SAP interfaces. And third, the portal enables single-sign-on security, which fortifies security and extends it to BI solutions.
- **Visual Composer enables SAP users to build both dashboards and analytic applications, although few do so yet.** A wide variety of applications can be built with Visual Composer, but its use in BI is mainly for dashboards. Users that TDWI interviewed complained that it's not a dedicated dashboard tool (which they'd like to have from SAP), but it gets the job done. SAP also provides Web Application Designer (WAD), and, according to SAP, its features will migrate into Visual Composer over time.
- **SAP users value data analysis, as long as it's based on OLAP.** After all, the BW component of NetWeaver BI was originally designed to be a hybrid OLAP platform, an analytic approach that it and BEx support very well. Although OLAP is still the most prominent analytic technique, data mining (sometimes called predictive analytics) is gaining. Among the styles of reporting and analysis listed in Figure 8, predictive analytics ranked low (17%). To date, SAP offers limited data mining or predictive analytics capabilities, so some SAP users fill the void with third-party products.
- **Enterprise reporting seems problematic with SAP's BI products.** Multiple users that TDWI interviewed said that BW with BEx is great for relatively small communities of business analysts, but not for enterprise reporting that involves thousands of users with thousands of reports. These users turned to enterprise reporting platforms from third parties.

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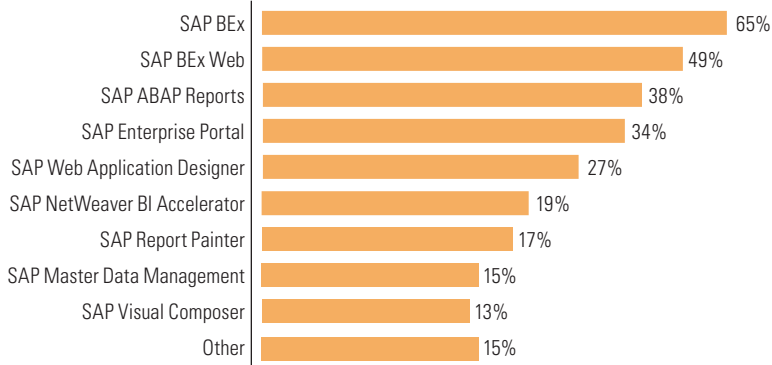
**What SAP products are you using for BI purposes? (Select all that apply.)**


Figure 9. Based on 502 responses from 172 respondents. Average responses per respondent: 2.9.

Most industry analyst firms knowledgeable in BI (like IDC and Forrester Research) list Business Objects, Cognos, and Hyperion as the top three reporting and analysis vendors in terms of annual revenue or market share. So, it's no surprise to see these vendors at the top of the survey results in Figure 10, which charts third-party BI providers for SAP. Hence, the SAP user community is using reporting and analysis tools in proportions nearly identical to the broader BI community.

However, the fact that SAP users have acquired third-party tools *at all* is interesting. Don't forget: the survey respondents for Figure 10 are all SAP users. The average number of responses per respondent is two, so an SAP customer on average uses two reporting or analysis products from other vendors. The point is that SAP users are somewhat voracious in tool consumption: they generously use BI products from SAP, as well as products from many other vendors.

But which is used most: tools from SAP or those from other vendors? To quantify this, TDWI Research asked: "What's the approximate percentage split between queries and reports running through SAP BI products versus non-SAP BI products?" (See Figure 11.) Non-SAP BI products edged ahead at 55% versus the 45% of SAP BI tools. The numbers are close enough that we should consider them tied. In other words, SAP users run roughly equivalent numbers of queries and reports through BI tools from SAP and other vendors, showing near-equal reliance on the two camps.

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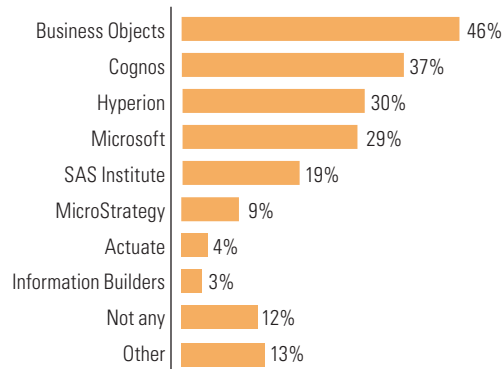
**Besides SAP, which other vendors have supplied reporting and analysis software to your organization? (Select all that apply.)**


Figure 10. Based on 349 responses from 172 respondents. Average responses per respondent: 2.<sup>4</sup>

<sup>4</sup>Survey respondents who selected "Other" entered the names of their reporting and analysis tools providers, including (in descending order by number of responses) Oracle, Brio, Siebel Analytics, Panorama, and CorVu.

What's the approximate percentage split between queries and reports running through SAP BI products versus non-SAP BI products?

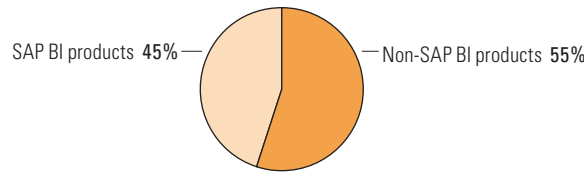


Figure 11. Based on 172 respondents.

Now that we've established that SAP users regularly turn to reporting and analysis products from SAP, as well as other vendors, let's revisit some common initiatives, methods, and report types to see which combination of products make sense for automating these. Figure 12 summarizes the vendors and products mentioned in this section.

**Spreadsheets.** As we've seen, SAP users commonly use spreadsheet-based BEx and BEx Web. For organizations with a spreadsheet addiction, BEx with BW is a good choice. Even so, other vendors also have tight integration with Microsoft Excel for BI purposes, including Actuate, Business Objects, Cognos, and—of course—Microsoft.

**OLAP-based data analysis.** As discussed earlier, the BW and BEx components of SAP NetWeaver BI are widely used in this regard. But many other vendors support OLAP, including Business Objects, Cognos, Hyperion, MicroStrategy, Microsoft, and Oracle. To avoid arguments over which approach to OLAP is best (desktop, relational, or multidimensional), most of these vendors support a hybrid form of OLAP that covers multiple approaches—as does SAP.

**Enterprise Portal for BI delivery.** Delivering BI in SAP's portal is a requirement that arises sooner or later. So SAP users contemplating the use of a third-party reporting or analysis tool should check to see that the tool is certified for SAP Enterprise Portal or is JSR 168 compliant (a standard portal interface). Vendors supporting SAP's portal include Actuate, Business Objects, Cognos, Hyperion, Information Builders, IBM, Informatica, MicroStrategy, Oracle, and Teradata.

**Dashboards for performance management.** Several BI vendors offer dashboard and scorecard tools that integrate with SAP, including Business Objects, Cognos, Hyperion, and SAS Institute.<sup>5</sup> For scorecards, SAP offers the Strategic Enterprise Management (SEM) application.

**Enterprise reporting.** SAP's BI products in their early days showed limitations with regard to enterprise-wide deployments, which is why some SAP users may turn to vendors with enterprise reporting platforms, like Actuate, Business Objects (Crystal Reports), Cognos, Information Builders, Microsoft, and MicroStrategy. Even so, TDWI interviewed a BI director with a large SAP NetWeaver BI implementation (involving multiple BW instances) that supports thousands of users. And TDWI's survey found that 19% of NetWeaver BI users support greater than one thousand users. So, enterprise reporting with NetWeaver BI is possible, though not common.

**Data mining or predictive analytics.** SAP's Strategic Enterprise Management (SEM) tool and some planning modules have forecasting capabilities that produce results similar to those of a predictive analytics application. And SAP NetWeaver provides some data mining capabilities. Nevertheless, predictive analytics is still a weak spot in SAP's BI portfolio. One SAP user TDWI interviewed had a need for advanced analytics, and he turned to SAS Institute for tools. Some turn to third-party planning tools like Cognos 8.2 Planning.

<sup>5</sup>For a discussion of dashboards (including vendors and products), see the TDWI Best Practices Report *Deploying Dashboards and Scorecards*, available online at [www.tdwi.org/Research/ReportSeries](http://www.tdwi.org/Research/ReportSeries).

## Vendor Products for Reporting and Analysis that Integrate with SAP

Vendor Name	Vendor Product	Vendor Web Site
Actuate	Actuate iServer	www.actuate.com
Business Objects	BusinessObjects XI Release 2, Integration Kit for SAP, Crystal Reports, Web Intelligence, Voyager, Xcelsius	www.businessobjects.com
Cognos	Cognos 8.2 BI, Cognos 8.2 Planning, Cognos Now!, Cognos Workforce Performance, Cognos 8 Report Pack for mySAP FI/CO	www.cognos.com
Information Builders	WebFOCUS for SAP	www.informationbuilders.com
Microsoft	SQL Server (Reporting Services, Integration Services, Analysis Services), BizTalk Server, Office 2007 PerformancePoint Server	www.microsoft.com
MicroStrategy	MicroStrategy Intelligence Server	www.microstrategy.com
Oracle	Oracle Business Intelligence Server Enterprise Edition, Oracle Business Intelligence Suite Enterprise Edition Plus, Oracle Hyperion Interactive Reporting, Oracle Hyperion SQR Production Reporting, Oracle Hyperion Web Analysis, Oracle Hyperion Financial Reporting	www.oracle.com
SAP	NetWeaver BI, which includes BEx, BEx Web, Visual Composer, and Enterprise Portal (See Figure 9 for a complete list.)	www.sap.com
SAS Institute	Enterprise Guide 4.1, SAS OLAP Viewer for .NET, SAS OLAP Viewer for Java	www.sas.com

Figure 12. This list is representative and not meant to be comprehensive.

## Data Warehouse Options

To review for a moment, SAP NetWeaver Business Intelligence—or simply NetWeaver BI—is a packaged collection of integrated BI and BI-related components. One of the components in the package is the data warehouse component, formerly called Business Information Warehouse, which most SAP customers call BW. This is SAP’s data warehouse platform, and—despite the other products in the NetWeaver package—it’s the one that users focus on most. That’s because other SAP BI products (like BEx) require it, it’s the oldest product in the package (so more customers have adopted it), it’s the component most often accessed by third-party products, and it’s an important data hub (though not necessarily the primary data warehouse) for most BI solutions for SAP. This section is about BW, how SAP customers use it, its relation to other data warehouse platforms, and related issues.

### Adoption of BW

BW sounds appealing, but do SAP customers use it? To answer this question and quantify BW’s adoption rate, TDWI asked: “Has your organization evaluated SAP NetWeaver BI (or BW)?” (See Figure 13.) Thirty percent of respondents (who are all SAP application users) have already deployed NetWeaver BI including BW, while another 21% are implementing it now, and 8% will implement it in the future. Totaling these shows that 59% of SAP users surveyed have made a commitment to

**A majority of SAP users are committed to BW.**

NetWeaver BI with BW, which is a high adoption rate for a BI product from an applications vendor. A mere 6% of respondents evaluated but then rejected BW, while 5% don't plan to evaluate it.

Of the small minority of respondents who evaluated and rejected BW, the survey asked: "Why did you reject SAP NetWeaver BI?" (See Figure 14.) By far, the leading reason for rejecting NetWeaver BI and BW is the preference for "an independent data warehouse" (70% of respondents). Note that this reason is about data warehouse architecture or the desire to leverage a preexisting EDW investment. In other words, it's not a complaint about BW. However, the remaining users offered reasons such as "we follow a best-of-breed strategy," "didn't fit our requirements," and "too expensive" (each was selected by 50% of respondents). Multiple respondents selecting "other" entered comments about BW's lack of flexibility.

**Users like SAP BW's business value, data model, fit to their needs, and low cost compared to custom development.**

To find out why the majority of SAP customers are committed to BW, TDWI's survey asked: "Why did you choose SAP NetWeaver BI?" (See Figure 15.) The leading reason for adopting NetWeaver BI is that it's bundled with enterprise software (59% of respondents), followed by a standardization strategy (55%). This isn't surprising, because (as discussed earlier in this report) application acquisition strategies that make SAP applications the corporate standard often have a domino effect of making SAP products the standard for BI and DW, too. These reasons for adopting BW are pervasive, but not exactly flattering for BW, as are more positive reasons, like strong business value (33%), prebuilt data model (32%), fit requirements (31%), and less costly than new development (30%). More compliments came from respondents who selected "other" and praised BW for being "easy to implement" and "easy to integrate with existing applications."

Note that few survey respondents feel that BW has good system performance (14% in Figure 15). And slow performance is one of the reasons a few users have rejected NetWeaver BI (30% in Figure 14). As with many data warehouse platforms, optimizing for speedy query performance is an issue with BW. To assist with this situation, SAP AG recently introduced a new BI product called SAP NetWeaver BI Accelerator. It's an appliance built around Intel processors. By applying data compression, parallel in-memory processing, and search technologies, NetWeaver BI Accelerator improves the performance of queries and shortens batch processes running on SAP NetWeaver BI, for which it is an add-on product.

To gauge the adoption of NetWeaver BI Accelerator, TDWI's survey asked of BW users: "Has your organization evaluated SAP BI Accelerator?" (See Figure 16.) A mere 5% of BW users have already deployed NetWeaver BI Accelerator, while another 5% are implementing it now, and 15% will be implementing it in the future. The adoption rate is low, but not bad, given that this is a new product. Adoption will probably pick up as more SAP customers evaluate it (25% are currently), and as the level of interest in data warehouse appliances in general continues to swell.

**Has your organization evaluated SAP NetWeaver BI (or BW)?**

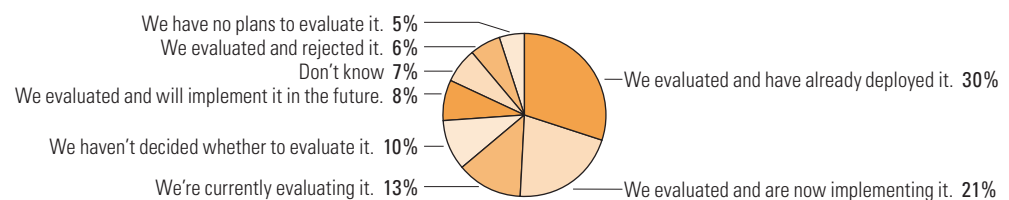


Figure 13. Based on 172 respondents.

Why did you reject SAP NetWeaver BI? (Select all that apply.)

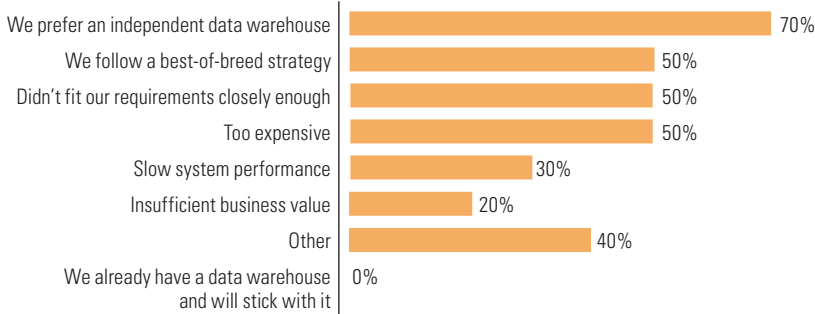


Figure 14. Based on 31 responses from 10 respondents. Average responses per respondent: 3.1.

Why did you choose SAP NetWeaver BI? (Select all that apply.)

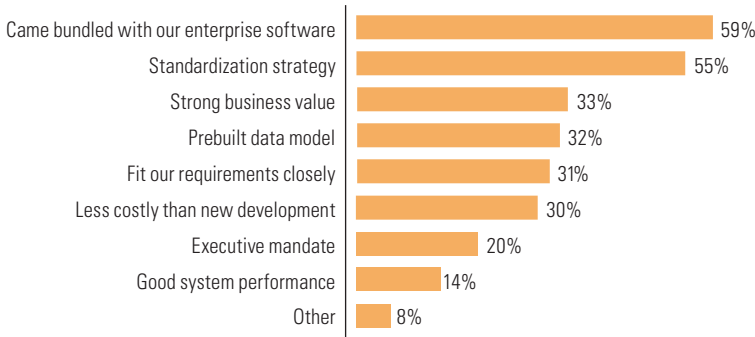


Figure 15. Based on 287 responses from 102 respondents. Average responses per respondent: 2.8.

Has your organization evaluated SAP BI Accelerator?

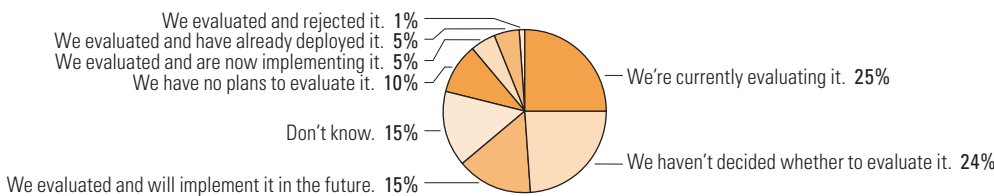


Figure 16. Based on 102 BW-using respondents.

Version and Upgrade Issues with BW and NetWeaver BI

There are good reasons why SAP customers should upgrade to NetWeaver BI version 7, the most recent release, which is sometimes called 2004s:

- **NetWeaver BI 7 is more open to non-SAP systems than prior releases of BW.** This is very important to SAP users who want to make the BW component of NetWeaver BI their primary data warehouse, which inevitably means integrating data from non-SAP sources into BW.

**Reasons to upgrade to NetWeaver 7 include its new openness, usability, and SOA support.**

- **BEx is better in version 7.** SAP users interviewed by TDWI pointed to the greater usability and interactivity of the BEx and BEx Web user interface as one of the reasons they upgraded.
- **NetWeaver provides an infrastructure for both application and data integration.** This provides more options for integration, as well as master data management, both inside and outside the SAP environment.
- **BI Accelerator requires the latest release.** The SAP NetWeaver BI Accelerator requires NetWeaver 7.0.
- **Its service-oriented architecture (SOA) enables new application options.** One of the users TDWI interviewed explained that he upgraded to 7, so he can use services to build composite applications that provide alternative user interfaces for SAP applications with low usability, as well as improve interoperability between application modules. Another user said he'd build composite dashboards for BI with NetWeaver 7.

The bad news is that a number of SAP users whom TDWI interviewed complained about the difficulties of upgrading from version 3.5 or earlier of BW to version 7.0. Admittedly, the difficulties are largely due to users' actions, like extensive customizations or the fact that they are multiple releases behind. The situation is exacerbated because the users in question lack internal resources for upgrades. For users in this situation, upgrades are unlikely anytime soon, which prevents them from reaping the benefits of the new functionality in version 7 of NetWeaver BI.

The good news is that many NetWeaver BI users are already on version 7 (43% in Figure 17 and 34% in Figure 18). Only 37% are one release behind on version 3.5, with 9% on other 3.x releases. No one answering the survey is on a pre-3.0 release. Adoption of version 7 should pick up soon, since many survey respondents plan to upgrade this year (25% in Figure 18) or next (23%).

Which version of SAP NetWeaver BI (BW) are you on?

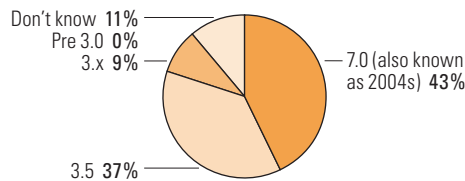


Figure 17. Based on 102 respondents.

Are you planning to implement (or upgrade to) SAP NetWeaver BI 7.0 (also known as 2004s)?

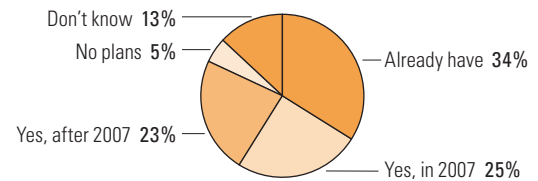


Figure 18. Based on 102 respondents.

**USER STORY**  
Some users find NetWeaver BI upgrades manageable.

“Early this decade, IT completed an application consolidation initiative that got most of the company using back-end applications from SAP,” said Michael Masciandaro, a BI director at Rohm and Haas, an international manufacturer. “Given that investment and the fact that most decision-support data was now in SAP, it made sense to go with SAP BW as the data warehouse platform. In 2001, we deployed release 2, then upgraded to 3.0 and 3.5, as required by newly added applications like SAP CRM and the portal. We’re considering using SAP Business Intelligence Accelerator, which would require an upgrade to NetWeaver BI version 7.”

**USER STORY**  
Some users find NetWeaver BI upgrades difficult.

“We’re very interested in using the more advanced data integration features of NetWeaver and the improved user interface of the latest BEx Web release,” said a data architect at a manufacturing firm. “But to get these, we’d need to first upgrade our old BW implementation to NetWeaver

2004s. Since we customized BW heavily over the years, the upgrade would be more like a new implementation, which we currently don't have budget or staff for. So, I guess we'll stick with what we've got."

Data Volume and Growth Rates for BW

One of the most important metrics for judging a data warehouse platform is data volume scalability. To quantify the scalability of SAP BW, TDWI asked SAP users, "Approximately how much data does your SAP NetWeaver BI data warehouse manage today?" (See Figure 19.) Based on survey responses, 41% of BW instances manage one terabyte or less of data, and 35% manage greater than one terabyte. 24% of survey respondents said they don't know, which probably means that their BW instance manages so little data that tracking data volume isn't necessary.

Of course, data volume is a moving target that grows constantly. So, TDWI asked "What's the approximate annual growth rate of data managed by your BW?" (See Figure 20.) The greatest number of responses were for 20% annual growth (25% of respondents) and 30% growth (24%). If we accept these as the norm and average them together we get 25%, which represents the average annual growth rate of data managed by the average BW implementation.

Let's provide a context for these data volume and growth numbers by comparing them to similar statistics TDWI has developed with other survey populations. For example, TDWI asked its Members (who use every data warehouse platform imaginable) to take a Technology Survey at its quarterly conference in May 2006 (143 respondents completed the survey). Fifty percent reported that their data warehouse will manage one terabyte or more by the end of 2007. This is higher than the 35% that SAP users reported. Based on responses to the Technology Survey, TDWI Members have data warehouses experiencing 33% annual growth in data volume, which is greater than the 25% that SAP users reported. TDWI found one SAP BW user who claimed to have broken the 10-terabyte barrier, which 8% of the TDWI Members surveyed have already done.

In summary, SAP BW instances handle data volumes and annual growth rates that are slightly conservative compared to those of the average data warehouse. Still, these figures prove that BW scales up into single-digit terabytes and occasionally higher.

SAP BW scales into single-digit terabytes and occasionally higher.

Approximately how much data does your SAP NetWeaver BI data warehouse manage today?

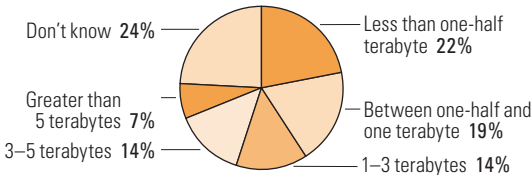


Figure 19. Based on 102 respondents.

What's the approximate annual growth rate of data managed by your BW?

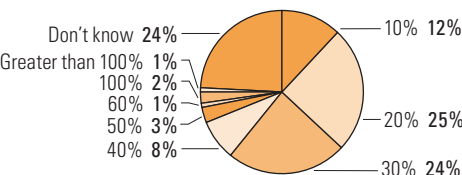


Figure 20. Based on 102 respondents.

TDWI interviewed a user whose process for finding the best data source is typical of SAP users and, in many ways, typical of report design in general: "When a request for a new report comes in, we first look at SAP standard business content, to see if data requirements for the report can be met there. Often, they can, especially with operational reports, and it's a straightforward process to bring the right data into BW through a standard extractor, then build a report for delivery in Excel. But

USER STORY Finding the right data for a report may be challenging.

some reports need data from outside SAP, so we have to decide whether to integrate non-SAP data into BW or populate the report from our EDW. If it's a mix of SAP and non-SAP data, we usually populate the report from the EDW.”

## Data Warehouse Platforms from SAP and Third-Party Vendors

### Coexistence of BW with Other Data Warehouse Platforms

Just as SAP application users have applications from other vendors, SAP BW users also have data warehouse platforms from other vendors. TDWI asked BW users, “Besides SAP, which other vendors have supplied data warehouse software platforms to your organization?” (See Figure 21.) It's no surprise that prominent vendors with databases used for data warehousing top the list, namely IBM, Oracle, Microsoft, and Teradata. Only 5% of respondents claim to have no data warehouse platform other than SAP BW. But note that the average number of responses per respondent is 1.3, which means that most SAP BW users have at least one non-BW data warehouse platform, and a few have two. Thus, in SAP-centric businesses, SAP BW coexists with other data warehouse platforms far more often than not.<sup>6</sup>

**Most SAP BW users consider BW to be their primary DW.**

This situation begs questions about the priority of data warehouses in a multi-DW organization. The survey asked, “How does BW relate to other data warehouses in your organization?” (See Figure 22.) Suprisingly, BW is used as an EDW more often than anticipated:

- **BW is often an EDW.** Interestingly enough, a majority of respondents described their BW as the primary or enterprise data warehouse (54%). This makes sense for SAP-centric organizations (which dominate the survey population), since most of their decision-support data comes from SAP ERP, which is easily accessed and integrated from BW. Even so, when SAP BW is the equivalent of an EDW, it means integrating data of non-SAP origin into BW.
- **Less often, BW is only for SAP-specific BI (37%).** TDWI's take is that this is how BW was used for years. Its elevation to EDW status is a recent development, linked to SAP applications becoming the corporate standard in the rampant ERP consolidations of this decade, as well as the increasing openness of SAP NetWeaver BI. In these cases, SAP-centric BW is probably complemented by other application-specific BI solutions and/or an enterprise-scope EDW.
- **A minority of users apply BW to data integration, not data warehousing.** SAP BW can be a useful staging area for moving data in and out of SAP (6%). After all, it's easier to move SAP ERP data to BW, then elsewhere, than to move it directly out of SAP ERP. The return trip is similarly simplified through BW. For example, TDWI interviewed a user who depends on BW (instead of SAP ERP directly) as a source for an EDW, although the BW instance in question serves no other purpose (like populating reports).
- **For some users, BW is becoming the EDW.** Respondents who selected “Other” reminded us, as we've seen before in this report, that many NetWeaver BI implementations are projects in progress. This is illustrated by comments like “SAP BW will be the primary [DW] when built” and “BW is planned to replace a legacy DW environment.”

<sup>6</sup>The question in Figure 21 is somewhat ambiguous, so respondents may have interpreted it in different ways. Note that BW is largely a collection of data models that requires a database management system (DBMS) from another vendor, and most users implement BW atop a leading relational DBMS. So, some respondents may interpret the question as being about the DBMS that BW sits atop, whereas others may interpret it as being about DBMS that their EDW sits atop. Either way, the same list of non-SAP vendors results.

Besides SAP, which other vendors have supplied data warehouse software platforms to your organization? (Select all that apply.)

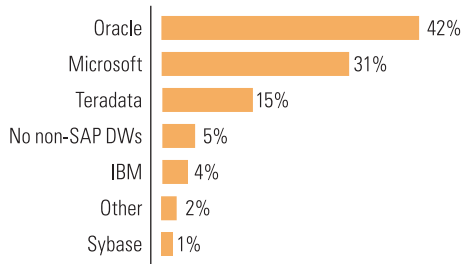


Figure 21. Based on 108 responses from 81 respondents. Average responses per respondent: 1.3.

How does BW relate to other data warehouses in your organization? (Select only one.)

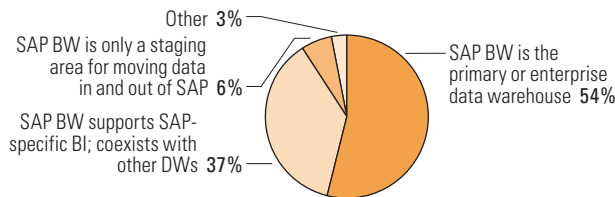


Figure 22. Based on 102 respondents.

“We have a small implementation of BW, which delivers reports through SAP Portal and analyses through BEx Web to a small SAP-centric user community,” said a data architect at a petroleum company. “I’d like to expand and update this implementation, but that would require upgrades. We also have an EDW that’s Oracle on Sun, with best-of-breed reporting and analysis tools. Due to the difficulty of upgrading NetWeaver and the priority given to our EDW, our BW implementation will probably stay small and SAP-centric.”

#### USER STORY

**BW may support SAP-centric BI, while an EDW supports enterprise-scope BI.**

#### Data Warehouse Methods and Architectures Mapped to Vendor Products

Now that we’ve established that SAP users regularly turn to data warehouse platforms from SAP, as well as other vendors, let’s revisit some common product types, methods, and warehouse architectures to see which products make sense for automating these. The vendors and products mentioned in this section are summarized in Figure 23.

**Relational database management systems (RDBMSs).** For many BI and DW professionals, the RDBMS is the DW platform, period. After all, the vast majority of data warehouses are custom-built atop an RDBMS brand of the user’s choosing. And packaged warehouses from SAP and other vendors are deployed atop them. As we saw in Figure 21, SAP users avail themselves of all the leading RDBMS brands, namely IBM, Oracle, Microsoft, Sybase, and Teradata.

Although RDBMSs are designed for general use with a broad range of transactional and BI applications, some also have capabilities explicitly designed for SAP environments. For example, an IBM executive explained to TDWI that “SAP itself is a benchmark for IBM.” Roughly half of DB2 enhancements in recent releases have come from SAP customers. And DB2 maintenance cycles line up with those of SAP products, so that SAP users can upgrade both simultaneously. Thus, when selecting an RDBMS for SAP applications or SAP BI, SAP users should ask vendors for explanations of SAP-specific functions, optimizations, and product packages, and assess how these will affect their ability to deploy and manage the RDBMS.

**Architecture: Data marts versus an EDW.** A classic argument in data warehousing is whether the architecture should be a collection of integrated data marts or an enterprise data warehouse that serves as the “single version of the truth.” TDWI prefers to avoid this religious war by pointing out that either path can lead to success. And the average data warehouse environment is evolving toward a hybrid combination of these, anyway, plus other components like operational data stores and data staging areas.

In terms of BI solutions for SAP, BW has a long track record of being a data mart that provides data for SAP-centric analytic applications. And this report has quoted users who complement such a “BW mart” with an EDW. But we’re now seeing SAP users who’ve made BW the EDW or an equivalent of it. Hence, BW now straddles the fence, proving that it works ably in both of the classic data warehouse architectures, as well as hybrids of them.

**Multidimensional data models.** Online analytic processing (OLAP) continues to be the leading methodology for data analysis, and it requires multidimensional data structures (usually called cubes). SAP users have a strong commitment to OLAP, which they regularly perform with the InfoCubes built into SAP BW and the analytic capabilities of SAP BEx. But all the RDBMSs support multidimensional data management for OLAP to some degree, and dedicated multidimensional databases (like Hyperion Essbase) are available with SAP support. Users that TDWI interviewed expressed satisfaction with OLAP-based analysis enabled by BW, so it’s a safe and effective place to start.

However, OLAP with multiterabyte databases may require additional products. For example, Teradata Virtual Access Solution, for SAP enables a technical SAP user to create virtual InfoCubes in BW, which are connected via services to large data sets in Teradata Warehouse. The SAP end user accesses the BW InfoCubes via his/her reporting or analysis tool, unaware that some of the data is sourced in real time from Teradata. Another product that could be added on for scalability is SAP NetWeaver BI Accelerator. Layering products this way extends the SAP user’s investment in NetWeaver BI and adds scalability to the BI solution for SAP.

**Packaged data warehouses.** One way to define SAP BW is that it’s a prepackaged data warehouse that consists of a collection of data models, semantic layers, and interfaces designed for BI with SAP data and within SAP business processes. Similar packaged data warehouses (though not specific to SAP data and users) include Cognos Workforce Performance, KALIDO 8E+, and Teradata Decision Experts (based on DecisionPoint, which Teradata acquired in 2005). Application-specific packaged data warehouses include Oracle Daily Business Intelligence, Peoplesoft EPM, and Siebel Analytics.

Despite the benefits of packaged warehouses—which reduce system integration and time to use, plus provide considerable intellectual property and domain expertise—they continue to be a minority in a world that mostly custom-builds its data warehouses. Among these, SAP BW is probably the most widely used, as a result of SAP’s large customer base and NetWeaver BI’s significant adoption rate (59% in Figure 13).

**Data warehouse appliances.** This is one of the most-discussed recent trends in data warehousing, and is reflected in new products like Cognos Now!, DATAlegro v3, HP Neoview, and Netezza Performance Server. Bundles that resemble appliances include IBM Balanced Warehouse and Sun-Oracle Data Warehousing Appliance Foundations. TDWI was unable to find SAP users with data warehouse appliances from these vendors, but appliances should eventually penetrate the SAP customer base.

Note that SAP NetWeaver BI Accelerator is an appliance in the sense that it’s built into a server blade and that it provides the key benefits of a data warehouse appliance: faster queries and minimal system integration prior to use. But it’s only for data warehousing with SAP NetWeaver BI, not the general use for which other data warehouse appliances are designed.

## Vendor Products for Data Warehousing that Integrate with SAP

Vendor Name	Vendor Product	Vendor Web Site
Cognos	Cognos Now!, Cognos PowerCube, Cognos Workforce Performance	www.cognos.com
DATAlegro	DATAlegro v3	www.datalegro.com
HP	Neoview	www.hp.com
IBM	IBM DB2, IBM Balanced Warehouse	www.ibm.com
Kalido	KALIDO 8E+	www.kalido.com
Microsoft	SQL Server	www.microsoft.com
Netezza Corporation	Netezza Performance Server®	www.netezza.com
Oracle	Oracle Database, Oracle Daily Business Intelligence Enterprise Edition Plus, Oracle Business Intelligence Suite Standard Edition One, Oracle Hyperion Essbase, Oracle Hyperion Data Integration Management Source Adapter for SAP BW, Sun-Oracle Data Warehousing Appliance Foundations	www.oracle.com
SAP	NetWeaver BI (BW component), NetWeaver BI Accelerator	www.sap.com
SAS Institute	SAS Solution Adapters for SAP	www.sas.com
Sybase	Sybase IQ	www.sybase.com
Teradata	Teradata Warehouse, Teradata Decision Experts, Virtual Access Solution, for SAP	www.teradata.com

Figure 23. This list is representative and not meant to be comprehensive.

## Data Integration Options

Performing data integration with SAP ERP is inherently difficult because of the complexity of SAP ERP's data structures and how they should be accessed. For example, SAP ERP's data model involves tens of thousands of tables with table and column names that are somewhat cryptic. Plus, there are numerous unique data structures such as pool tables, cluster tables, iDOCs, hierarchies, and logs. The data of a single record may be distributed across many of these data structures, so accessing them directly is difficult and may lead to data integrity problems. Instead, it's usually best to access data through the application layer of SAP ERP, which involves function calls into the SAP business application programming interface (BAPI) or SAP's query language ABAP (which is similar to SQL).

Hand-coding continues to be a prevalent practice in data integration, and some SAP users and consultants write ABAP code or routines that call BAPIs (28% in Figure 24). But this kind of hand coding is hard and seldom reusable. So, most SAP users minimize their exposure to SAP ERP's complexity by relying on the integration capabilities built into SAP ERP and NetWeaver (81%) or data integration tools from third-party vendors (32%), especially tools that support the data

**SAP's data environment is a hard nut to crack without the right tools.**

integration method called extract, transform, and load (ETL). Respondents averaged 1.4 responses in Figure 24, which reveals that SAP users are like others: most perform data integration with a combination of hand coding, dedicated tools, and functions built into larger systems.

What ETL or other data integration tools do you use to populate a data warehouse with data from SAP applications? (Select all that apply.)



Figure 24. Based on 145 responses from 102 respondents. Average responses per respondent: 1.4.

### Integrating Data into SAP BW

TDWI asked a series of questions of SAP BW users to understand the data content of BW and how often it’s refreshed:

- Most BW users integrate some non-SAP data into BW.** When asked, “Do you extract data from sources besides SAP for loading into BW?” two-thirds answered yes (68%) and a quarter said no (27%). (See Figure 25.)
- By far, most data in BW comes from SAP sources.** TDWI asked, “Of the data managed by your BW, what’s the approximate percentage split between data from SAP sources versus non-SAP sources?” (See Figure 26.) By averaging the figures that respondents entered, we see that, in the average BW instance, a whopping 80% of the data comes from SAP sources, whereas only 20% comes from outside SAP.
- Once a day is the norm for integrating data into BW** (69% of respondents in Figure 27). But some data feeds are continuous (19%) or recur multiple times daily (25%). At the other extreme, some feeds are weekly or monthly, probably for financial closings.

In summary, most BW instances are fed data once a day on average, and most are fed data from both SAP and non-SAP sources, yet the non-SAP data is only 20% of BW’s content on average.

Do you extract data from sources besides SAP R/2 and SAP R/3 for loading into BW?

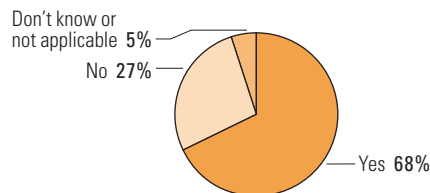


Figure 25. Based on 102 respondents.

Of the data managed by your BW, what’s the approximate percentage split between data from SAP sources versus non-SAP sources?

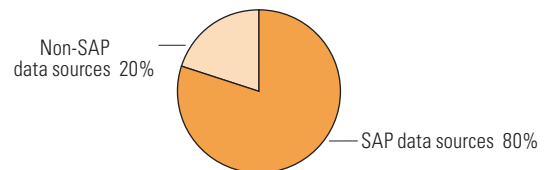


Figure 26. Based on 102 respondents.

How frequently do you feed data into your SAP NetWeaver BI data warehouse?  
(Select all that apply.)

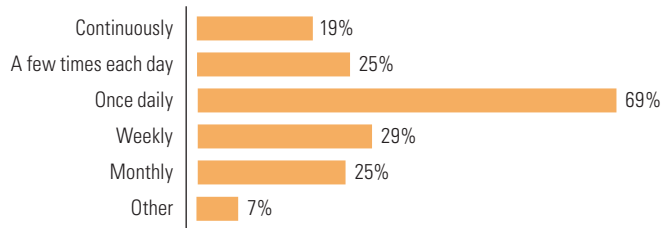


Figure 27. Based on 178 responses from 102 respondents. Average responses per respondent: 1.7.

## Data Integration Options from SAP and Third-Party Vendors

A couple of capabilities stand out in SAP support of data integration:

- **SAP OpenHub** is a data utility that can dump data from BW to a flat file or relational table. It's used for bulk data movement out of BW. In addition, Teradata and other vendors offer tools that add more functions and control to OpenHub.
- **Standard extractors** are built into SAP infrastructure for moving data (and sometimes transforming it) among SAP ERP, BW, CRM, and other SAP environments. Most of these can operate in real time to refresh BW as transactions or other events occur.

“SAP standard business content—the overall data model delivered with the SAP BI solution—is linked to SAP ERP systems via what are considered Standard Extractors,” said Penny Silvia, a leader in HP’s Information Management Practice. “At last count there were more than 15,000 fields mapped from SAP ERP to SAP BI through more than 1,000 Standard Extractors. This gives you an array of easy options for feeding SAP ERP data into SAP BI without custom development or use of third-party ETL tools. For those source systems not covered by standard built-in extractors there are tools (such as DB Connect) delivered with the SAP BI suite that allow you to connect to a variety of non-SAP systems, as well as load via generated flat files. The suite of data movement tools that comes with SAP BI is impressive, but there still may be opportunities when you chose to use a traditional ETL tool for frequent, recurring, and/or highly complex data loads and transformations from non-SAP systems into the SAP BI solution.”

**EXPERT COMMENT**  
**SAP standard extractors enable data integration.**

Let’s consider a few common scenarios where data integration products or capabilities from SAP and third-party vendors are applied. Figure 28 summarizes the data integration vendors and products mentioned here.

### **Integrating data across SAP-only sources and targets is usually done with SAP capabilities.**

Simple solutions like this are easily set up and maintained with SAP standard extractors and other data integration capabilities built into SAP infrastructure.

**SAP users turn to third-party data integration tools to cope with complexity.** The complexity is usually due to diverse data sources and/or diverse target data warehouse platforms, as illustrated by the following user story:

“We use NetWeaver BI—or BW, as we still call it—as a data store for cube-based analysis and operational reporting off of SAP data,” said a data integration specialist at a manufacturer. “For heavy analytics and enterprise reporting, we have an EDW, which means we end up moving a lot

### USER STORY

**Two-way data movement and legacy access are typical requirements for a third-party ETL tool.**

of data between NetWeaver BI and the EDW. I use a high-end ETL tool, and I love it. It generates ABAP and automatically ties into the BAPIs and other interfaces of the SAP environment, so I needn't deal with SAP ERP directly. Plus, the ETL tool supports diverse non-SAP, legacy, and relational data sources, which we have a lot of."

**Connectors are key to third-party tool success.** All the leading ETL tools have so-called connectors that support SAP BAPIs to SAP ERP, BW, and other SAP components. These are usually add-on products for the main ETL tool environment, with an additional cost. But such connectors are worth the expense, because they insulate the data integration specialist from the complexities of SAP ERP. Some also provide extra value in the form of data transforms for SAP data and friendly semantic layers that simplify the appearance of SAP data. Such connectors are available for ETL tools from Business Objects, IBM, Information Builders, Informatica, Microsoft, Oracle, and SAS Institute.<sup>7</sup> Likewise, some tools for enterprise information integration (from vendors like Composite Software) have similar connectors.

**Packaged analytic applications.** Due to the difficulties of data integration in SAP environments, analytic applications for SAP from third-party vendors tend to have a heavier data integration component than usual. Of course, they still include prebuilt data models and reports, as with any packaged analytic application. Representative products include BusinessObjects Rapid Marts for SAP (which depend heavily on BusinessObjects Data Integrator) and Cognos 8 Report Pack for mySAP FI/CO (which integrates with Composite Application Data Services for SAP BW). SAP, too, offers packaged solutions, like SAP Business Planning and Consolidation and SAP Business Profitability Management.

**Some forms of data integration are best done with a reporting tool.** For example, some operational reports need fresh data drawn directly from SAP application databases, with no need for SAP BW or any other data warehouse. SAP ERP interfaces are supported for this by many of the reporting tool vendors, like Business Objects, Cognos, Information Builders, Microsoft, MicroStrategy, and SAS Institute. For example, Cognos 8 Data Manager and Cognos Data Adapter for mySAP can both interface with SAP ERP and its source data. And SAP products like BEx and Visual Composer can also access SAP ERP directly. Letting the reporting platform do the data integration simplifies one of the thorniest goals that SAP users have: getting data from multiple sources into a single report. Obviously, this works when data is usable straight from applications databases; if transformation or complex joins beyond the ability of the reporting tool are required to merge the data, then an ETL tool and DW may be required.

**Most SAP users are not taking data quality seriously enough.** A few SAP users have data quality tools, but these are usually applied to operational data, not BI data. SAP users willing to correct this omission can avail themselves of data quality tools with SAP support, including BusinessObjects Data Quality for SAP, DataFlux Adaptor for SAP, IBM QualityStage, and Trillium TS Quality. SAP NetWeaver MDM also includes some data quality functions.

## Vendor Products for Data Integration that Integrate with SAP

Vendor Name	Vendor Product	Vendor Web Site
Business Objects	Data Integrator, RapidMarts for SAP, Data Quality for SAP	www.businessobjects.com
Cognos	Cognos 8 Report Pack for mySAP FI/CO, Cognos 8 Data Manager	www.cognos.com
Composite Software	Composite Information Server, Composite Application Data Services for SAP BW, Composite Application Services for SAP R/3	www.compositesw.com
DataFlux	DataFlux Adaptor for SAP	www.dataflux.com
Information Builders	iWay Universal Adapter Offering for SAP NetWeaver	www.iwaysoftware.com
IBM	DataStage, QualityStage, Information Server with connectors to SAP ERP and BW	www.ibm.com
Informatica	PowerCenter®, PowerExchange™, Data Quality, Complex Data Exchange	www.informatica.com
Microsoft	SQL Server Integration Services, BizTalk Server	www.microsoft.com
Oracle	Oracle Warehouse Builder, Oracle Data Integrator	www.oracle.com
SAP	Universal Data Connectivity with SAP NetWeaver, SAP NetWeaver MDM	www.sap.com
SAS Institute	SAS Data Surveyor for SAP	www.sas.com
Trillium Software	TS Discovery, TS Quality	www.trilliumsoftware.com

Figure 28. This list is representative and not meant to be comprehensive.

## Recommendations for SAP Users

- **Revisit your BI solution for SAP.** Many are old enough that they need updating. Events like mergers, reorganizations, and IT system consolidations may have changed your BI requirements. And new products and releases—from SAP and others—have introduced more BI tool options.
- **Don't assume that an SAP-centric application strategy means SAP-centric BI.** Centricity is a matter of degree, and your BI solution shouldn't be as SAP-centric as your operational applications. Otherwise, BI is too tactical and operational, with limited strategic ability.
- **Don't confuse ERP requirements with BI requirements.** Even if SAP ERP meets most of your ERP requirements, there's no reason to assume that SAP BI products will do the same for BI requirements. TDWI Research feels strongly that BI is best when its requirements are researched and the solution is planned through a collaboration involving people in many departments and in both business and IT. When you circumvent the collaborative process, you run the risk of building a technology solution that satisfies few business requirements.
- **Analyze the present and the future, not just the past.** Most SAP users are good at operational reporting and backward-facing OLAP analysis. But that's not enough. You need to embrace operational BI to monitor the present through BI. And consider implementing predictive analytics, which helps predict the future.

- **Look for SAP certifications when evaluating third-party BI products.** But don't stop there. Certification doesn't assure product quality, so you still have to evaluate carefully.
- **Start your BI solution for SAP with NetWeaver BI.** By far, most users TDWI interviewed and surveyed reported success with NetWeaver BI (though usually in narrow-scope solutions). Even if you start elsewhere, NetWeaver BI is too useful, cost-effective, and low-risk to ignore. So it will probably be part of your solution, whether it's the centerpiece or not.
- **Don't stop with NetWeaver BI.** TDWI's survey shows that most SAP-centric businesses have BI products from SAP plus multiple other vendors, because third-party products fill the voids of NetWeaver and vice versa. A multivendor BI solution entails extra cost and complexity, but that's often the reality of high-quality BI based on user requirements.
- **Consider giving your spreadsheet jockeys spreadsheet-based BI tools.** Financial personnel, sales managers, and line-of-business managers are productive with spreadsheets, and spreadsheet-based BI products from several vendors leverage this productivity.
- **Turn to third-party tools for certain BI tasks.** This involves more advanced methods of BI, like enterprise reporting, predictive analytics, and data visualization. Some users TDWI interviewed wished for a dedicated dashboard tool, instead of SAP's Visual Composer.
- **Anticipate folding SAP Enterprise Portal into your BI solution.** No matter which vendor's reporting tools you're using, most organizations want reports delivered via the portal.
- **Consider NetWeaver BI for data of SAP origin.** Given the difficulties of extracting SAP application data with non-SAP tools and NetWeaver's tight integration with SAP data, NetWeaver BI makes a lot of sense for bodies of reports, analytic applications, and data analyses that are sourced exclusively or almost so from SAP applications. Since standard extractors can trickle-feed data from SAP applications into BW, real-time BI methods are possible with SAP data, like operational BI and on-demand computing.
- **Admit that you need an EDW or its equivalent.** Many SAP users practice tactical BI focused on the data of one application at a time, with little strategic BI that encompasses the total enterprise and its future. Strategic BI requires an EDW or its equivalent to pull together information representing as much of the larger organization as possible.
- **Decide whether your EDW will be independent, built on BW, or a hybrid.** Support the decision with an executive mandate. But first make the decision with guidance from a cross-function team, because the decision affects warehouse architecture, the priority of applications, BI ownership and sponsorship, cost, and so on.
- **Expect to use diverse data integration solutions.** SAP's standard extractors are good for moving data among SAP components. But third-party data integration tools or hand-coded solutions are useful for integration beyond SAP that involves moving data in or out of SAP, numerous sources and targets, complex data transformations, or legacy platforms.
- **Look forward to using services for BI.** NetWeaver's support for service-oriented architecture (SOA) promises to enable composite applications that can fold BI components into dashboards, portals, and even operational application user interfaces. When turning to third-party BI tools, look for the "Powered by NetWeaver" certification to assure SOA support.
- **Take data quality more seriously.** Most SAP users that TDWI interviewed are ignoring data quality. SAP users should consider applying quality measures both in real time as data is entered in SAP applications and in batch to cleanse the content of SAP BW.



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## **TDWI RESEARCH**

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TDWI Research provides research and advice for BI professionals worldwide. TDWI Research focuses exclusively on BI/DW issues and teams up with industry practitioners to deliver both broad and deep understanding of the business and technical issues surrounding the deployment of business intelligence and data warehousing solutions. TDWI Research offers reports, commentary, and inquiry services via a worldwide Membership program and provides custom research, benchmarking, and strategic planning services to user and vendor organizations.



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