Visual Composer or BEx?

Pick the Right Tool for the Right Application

by Scott Cairncross, Prakash Darji, and Derek Johnson, SAP

As SAP NetWeaver evolves, so do its toolsets, and SAP NetWeaver Business Intelligence (SAP NetWeaver BI) offerings are no exception. There has been a proliferation of new and improved frontend tools for building applications and reports. So how do you decide when to use one tool over another?

Most SAP NetWeaver BI users are already working with the SAP Business Explorer (BEx) tools built into their SAP NetWeaver BI system. But with the release of SAP NetWeaver 2004s comes new additions to this toolset that every SAP customer should consider — as well as third-party reporting capabilities and SAP's latest release of the SAP NetWeaver Visual Composer (VC) design environment. Each tool has its own distinct purpose, and together they address a variety of reporting requirements (see sidebar on page 34).

If you're not yet familiar with these new and improved frontend tools for composing analytic applications and reports, or you're weighing the options for ensuring that analysts and other business users can extract the information they need for business decision making, this article can help you determine the right tool for the job.

Before we delve into more detail about the tools — and examples of which ones to use when — let's start with *why* you'd use these tools in the first place.

Three Key Criteria to Assess Your Analytics Needs

The right tool depends, first and foremost, on what you're asking your users and your analytics to do. The array of analytics and reporting tools at your disposal fulfill reporting requirements such as Excel- and Web-based formatted reporting, ad hoc reporting and analysis, management reporting, planning, and guided analysis. There are also possibilities for a new type of analytic application — the composite analytic application — that embeds analytics functions directly into the context of a business process, linking information from your SAP NetWeaver BI and transactional systems.

To determine what tool you want to use, key considerations should include:

- **Your reporting and analysis requirements** — Do you need an analytic application, an Excel report, or a portal-based query? Do analysts require elaborate and extensive drill-down capabilities? Do casual business users need regularly scheduled periodic updates, or is a manager looking for a one-time static report?

- **Your data source** — Are you simply extracting information from your SAP NetWeaver BI system? Or do you need a more dynamic information flow between SAP NetWeaver BI and other systems? Is some of the information coming from outside your BI system?

- **The user of the tool** — Do you want IT or a Java-savvy designer to create an application, or do you want a business analyst or another super user to build a query? What programming and application design skills does your user have?[1]

With these requirements in mind, let's explore these tools, look at some scenarios, and see how an understanding of the tools out there will help you find the right fit for your applications.

The Tools: A Functional View

The 2004s version of SAP NetWeaver brings with it the new BEx Report Designer, as well as improvements to existing tools such as the BEx Web Application Designer (WAD). The Visual Composer design environment, with its new analytics capabilities, is also generating a lot of excitement. Here is a look at these and other useful tools for composing analytic and reporting applications.

SAP BEx Suite

SAP Business Explorer is SAP's suite of frontend tools that provide specific functions for formatted reporting, Excel add-ins, Web-based reporting, and other capabilities, all designed specifically for SAP NetWeaver BI.

[1] Although many tools can leverage Java or Web development expertise, there is an increased focus on enabling the casual user with minimal training to customize their own queries and analytic applications quickly and easily.

Tools for Building BI Queries, Reports, and Applications: A Glossary

SAP Business Explorer (BEx) Suite

BEx Query Designer — The central tool used within the BEx Suite to design your BI queries. These queries can later be used in the BEx Analyzer, Web Application Designer, and Visual Composer as data providers. BEx Query Designer is available in a desktop-based Excel version and a version for Web-based query design.

BEx Analyzer — A Microsoft Excel add-on reporting tool used for analysis. BEx queries can be embedded within Excel workbooks; both the OLAP capabilities of the SAP NetWeaver BI platform and the calculations and formulas of Excel are available for analyzing reports. A Web version of this tool is also available for online access to interactive functions in reports based on HTMLB iViews.

BEx Web Application Designer (WAD) — A desktop application used for creating Web and analytic applications

that render SAP NetWeaver BI information using tables, charts, and graphs.

BEx Report Designer — A desktop application used to create static or dynamic formatted reports. The reports can be viewed within a Web browser or generated as a PDF.

SAP NetWeaver Visual Composer

Visual Composer — A Web-based application development environment that can be used to create composite analytic applications rendered within SAP NetWeaver Portal. Visual Composer connects analytic and transactional information from SAP and non-SAP systems and places them within the context of a business process. A notable feature of Visual Composer is that it is a *model-driven* application development environment producing meta-applications that can be rendered and presented in Adobe Flash, HTMLB, traditional Web Dynpro, or even as a voice application.

From the first release of SAP Business Information Warehouse, the BEx Suite has provided analysts and other super users with interfaces and tools for creating reports and analyzing data within their data warehousing systems. The BEx Suite allows users to display static reports and analyze data via the OLAP engine, extracting important pieces of information to enable decision makers to better run their business.

Since their inception, BEx tools have allowed users to build sophisticated queries, leverage Excel add-ins, and provide Web reporting — and these toolsets continue to be enhanced to support even more sophisticated reporting scenarios. For instance, the latest additions to the BEx Suite include the Report Designer for building formatted reports, as well as enhancements to the Web Application Designer for building guided

procedures-based applications. WAD also includes new Web items to allow users to quickly develop Web-based analytic applications (see **Figure 1**).

SAP NetWeaver Visual Composer

Visual Composer is a relatively new addition to the SAP frontend development toolbox.[2] Visual Composer is a Web-based application development environment used to create composite analytic applications rendered within SAP NetWeaver Portal.

Going beyond SAP's traditional strengths of functionality and best-in-suite integration, Visual Composer is notable as a *model-driven* development environment, which means that no coding skills are required. Visual Composer's final product can be displayed in a number of formats, giving you the flexibility you need to present BI information in sophisticated graphs and other robust applications. The resulting meta-applications can be rendered and presented in Adobe
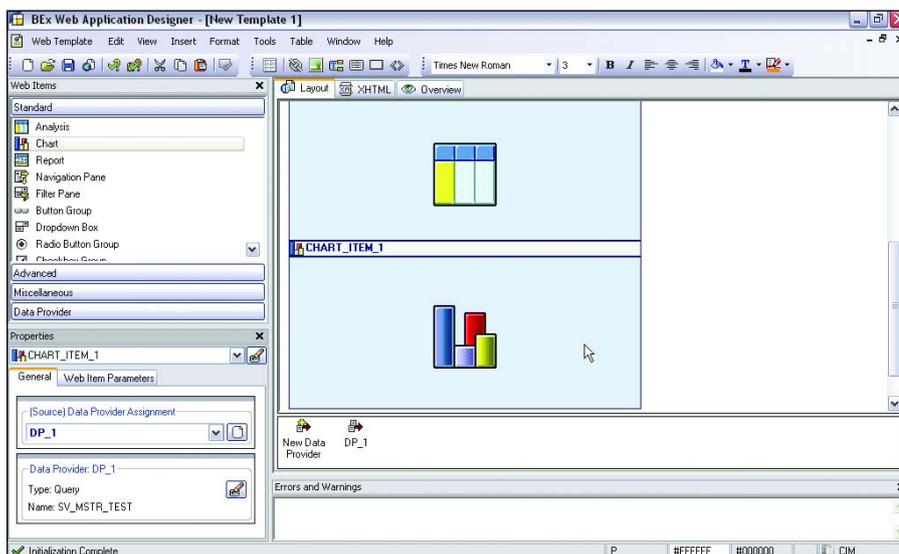

| Figure 1 | Designing the Layout for a Web-Based Analytic Application with BEx Web Application Designer |

2   For an introduction to an earlier version of Visual Composer, see Karl Kessler's article for developers, "Visual Composer — A Model-Driven Development Tool for Enterprise Portal iViews" in the October-December 2004 issue of *SAP Insider* (www.SAPinsider.com).

Flash, HTMLB, and Web Dynpro, or as a voice application.[3]

Designing Web-based analytic applications using Visual Composer is very easy and, well, just plain fun! Visual Composer's analytic development environment (ADE) allows users to drag and drop UI elements (various views) and services (such as BI queries, BAPIs, and Web services), then connect them with input and output "ports" to design the application's flow (see **Figure 2**). Even those without much coding experience can connect the various tables and charts between the different elements within the ADE's design time, creating rich and robust applications quickly and easily.

With applications created using Visual Composer, data is accessible using RFCs as well as the SAP NetWeaver BI Kit, which users access through the BI Integration Wizard interface. The SAP NetWeaver BI Kit is part of Visual Composer, facilitates the direct integration of the design environment with SAP NetWeaver BI, and supports the use of SAP NetWeaver's Universal Data Integration (UDI) framework and the SAP NetWeaver BI Web API to connect to both SAP data sources (i.e.,

via queries and views) and non-SAP data sources (i.e., via external database tables). The entire set of SAP xApp Analytics offerings — SAP's composite applications for analytics based on SAP NetWeaver BI and other solutions — is built on this foundation.

Tools for Custom Reporting

When the BEx Suite or Visual Composer cannot meet special sets of requirements, a custom reporting application may be needed. SAP recognizes this fact and addresses it by providing tools and a development environment that help super users and developers build their own reports to meet specialized requirements. BSPs, Java applications, and now Web Dynpro (for both Java and ABAP) can be used to meet difficult and specialty requirements for customized reports (see sidebar on next page).

For formatted reporting, third-party tools are available to support special needs, including pixel-perfect requirements for legal documents or other highly formatted reports.

An Example: One Report, Many Options

Consider a common report that users might request in a variety of formats: the P&L statement. Many information

consumers view the P&L statement, among them the accounting team and the management team. But these teams don't necessarily need identical information from the P&L. The accounting team will repeatedly analyze the entire P&L for reconciliation and financial integrity purposes, whereas the management team is primarily concerned with profit contribution margin (PCM), profit before tax (PBT), and gross sales.

For their purposes, the accounting team would want to see the P&L report in Microsoft Excel to facilitate comparisons with their own calculations and to help tie back the numbers. This Excel report is distributed to managers at different times during the month to evaluate the numbers; for example, the accounting team needs to drill down on ERP data to determine the state of completion of large construction orders for revenue recognition purposes (i.e., verification of results analysis calculations, settlements, and billings).

In contrast, the management team prefers total financial results in the form of a dynamic Web cockpit for conference room meetings. They also request printed reports to read during the train ride to work. While the backend data source is the SAP NetWeaver BI system, the formats and functions of these analytics are very different. So

---

[3] For a step-by-step introduction to Visual Composer, see the article "Create Analytic Apps Without Programming" in the Spring 2006 issue of *SAP NetWeaver Magazine* (www.netweavermagazine.com).
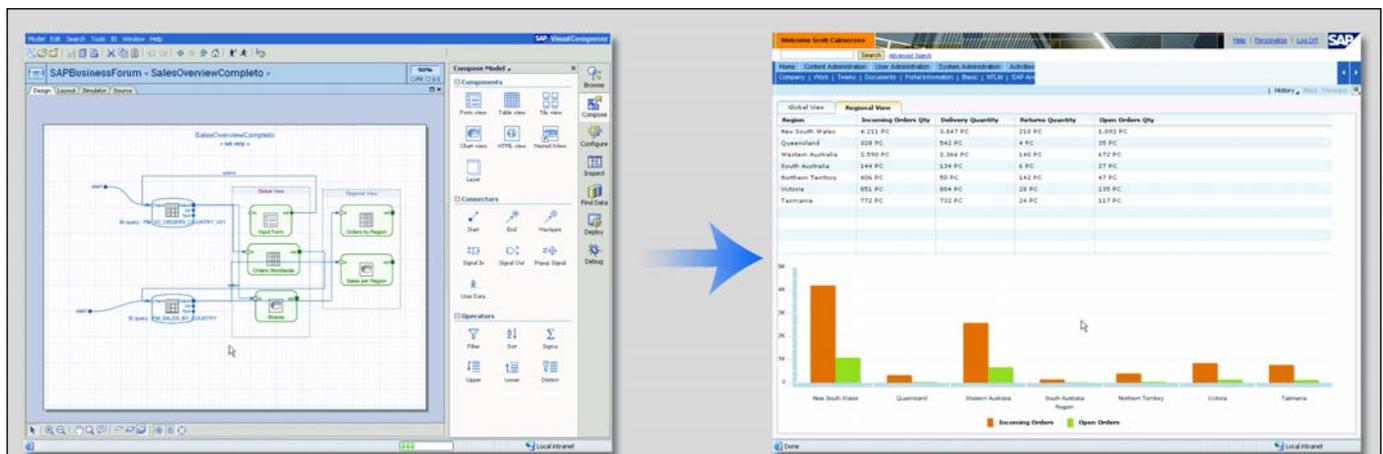

| **Figure 2** | Examples of the Drag-and-Drop Features Used to Build an Application with Visual Composer and the Resulting Analytic Application |

Additional Ways to Customize Your Online Analytic Applications

Business Server Pages (BSPs) — In the Web Application Builder or other standard design environments, BSPs are used to design and implement Web applications based on SAP solutions. Similar to generic ASPs and JSPs for the Java community, BSPs are a server-side scripting technology in the ABAP stack that provide access to all aspects of the application server, from function modules to database tables.

Java Web Application Server — Web applications can be developed on top of the SAP Java Web Application Server using Java and can communicate with backend SAP systems via the SAP Connector Framework.

Web Dynpro — Web Dynpro is SAP NetWeaver Application Server's programming model based on MVC, the Model-View-Controller principle, which is the logical segregation of programming related to the UI, the database, and the "middleman," the controller that passes the information between the database and the UI.[4]

[4] See Karl Kessler's article "Web Dynpro — Not Just for Java Developers Anymore" in the January-March 2006 issue of *SAP Insider* (www.SAPinsider.com).

Tool	Characteristics	Great for...
BEx Web Application Designer	• OLAP functionality (powerful drilldown, slice-and-dice data mining, filtering, sorting, and other classic data-mining functionality) • Designed specifically for SAP NetWeaver BI	Analytic applications — building Web applications with powerful OLAP functionality based only on SAP NetWeaver BI source data
BEx Report Designer	• Designed specifically for SAP NetWeaver BI	Static or dynamic formatted reports — viewed within a Web browser or as a PDF document
Visual Composer	• Top-level connections to various information sources, including legacy and non-SAP systems • Model-oriented • Sophisticated analytic applications • Deployed using Adobe Flash for stunning visual appeal	Analytic applications — producing sophisticated analytic applications supporting Flash animation, which can be built by super users without lots of programming expertise
Figure 3	A Quick Glance at the Tools for Building Analytics and Reporting Applications for the Web	

which tools would work best for each scenario (see **Figure 3**)?

OLAP Functionality Required? Use BEx

The accounting team needs to ascertain the financial impact of large orders still open, so what tool can a super user choose to accommodate this? To filter and drill down to evaluate the recognizable revenue, the capabilities of the BEx Analyzer and OLAP are ideal. The OLAP engine supports an array of capabilities — data filtering, drilldown, and pivoting on axes — allowing the accounting team to analyze and re-analyze at the click of a button. Not only can the accounting team use all of the functions of OLAP and BEx to slice and dice, but the financial functions within Microsoft Excel are available as well. BEx Analyzer supports OLAP functionality and is designed specifically for accessing data from the SAP NetWeaver BI system.

The steps for implementing a BEx query are simple and quick. First, the super user opens up the BEx Query Designer that accesses the P&L query and makes sure it is defined correctly and has the required level of detail. Second, this query is embedded in a Microsoft Excel workbook and formatted accordingly. Accountants are now ready to analyze open orders.

Formatted Report? Use BEx Report Designer — Or Consider Third-Party Reporting Tools

But we're not finished yet. Remember that management wants to see the P&L in both a Web cockpit and in print for an internal status meeting (and of course for the train ride to work). Let's look at the printed report first.

In the past, when it came to a formatted report for your management team, BEx had its limitations. Using the BEx Analyzer to create formatted reports requires a good understanding of the BEx toolset, as well as Microsoft Visual Basic. This programming knowledge is

very important when formatting the reports to meet format guidelines (details like setting 1½-inch margins, for example).

Third-party formatted reporting solutions can be used to provide the management team with their printed reports — especially when there is a need for pixel-perfect reports, such as for legal documents (see **Figure 4**).[5] In those cases, third-party formatted reporting solutions give super users the capability to format information to their heart's content without the need for programming.

In other cases, though, SAP customers already own a formatted reporting tool, since BEx Report Designer now provides this functionality by being fully integrated into the BEx Suite. This eliminates the need to have a Visual Basic programmer for customization within Excel. The Report Designer can meet the management team's specific formatting needs with its dynamic and static reporting sections, its row-based orientation of data, and most importantly its PDF printing capabilities.

What About a Web Cockpit — Do You Choose BEx or VC?

For designing the management-requested Web cockpit for your P&L statement, you can use either the BEx WAD or VC. A critical factor in determining the right tool is understanding how the end user will interact with the data. For instance:

- If you want the analytic application to show a high-level view of business processes with gauges, charts, and tables, either tool is appropriate.

- If users need to further interact with the analytic application in an unstructured manner, the BEx WAD is the appropriate tool.

- If you want to enable users to look at issues in a structured manner, or there's a need to add business rules
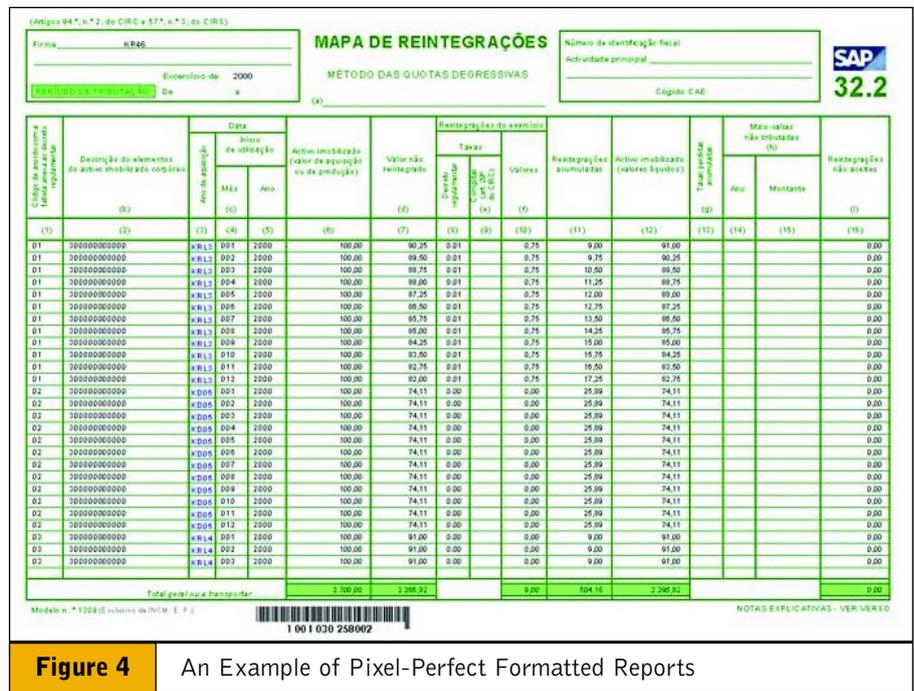
Figure 4   An Example of Pixel-Perfect Formatted Reports

to the output, Visual Composer would be the right tool.

There is enough overlap between these tools, however, that picking the right one can still be difficult. To further illustrate this point, let's add some more complexity to this Web cockpit example.

More Web Cockpit Specifics

Imagine that the management team's internal status meeting is coming up at the end of the week. A request for an ad hoc cockpit was made to integrate the company's balanced scorecard metrics with market information and allow the team to enter corrective actions that should be taken based on this information. The management team needs to evaluate whether the company is meeting all of its monthly financial objectives and visualize the relationships to other performance metrics across customer, internal process, and human resource perspectives.

This scenario requires the integration of the SAP SEM Corporate Performance Management (CPM) solution with market insights from providers like ACNielsen and IRI for a complete picture of the overall business. This analytic application will also require some nice graphs and

dials, along with charts and tables, to convey the information concisely and still be visually appealing. Since the goal of this analytic application is to get the entire management team on the same page, there will be minimal need for OLAP capabilities to interact with the data.

So What's the Right Tool for This Web Cockpit?

At first glance, the BEx Web Application Designer appears to be an ideal candidate for creating the Web-based cockpit. Using the BEx WAD, an application can be easily created to display CPM-type data along with the marketing data from ACNielsen and IRI. However, using this approach requires the data to be integrated into the data warehouse by either loading the information into multidimensional data marts or using UDI services to virtually extract data from its source (ACNielsen and IRI in this case). Such development requires governance and time you may not have, and it still does not address how corrective actions will be assigned.

The alternative is to integrate the data in a frontend tool for quick deployment using Visual Composer. The move

toward Web-based applications and development tools like Visual Composer enables the development of sophisticated analytic applications in a user-friendly environment that can be rendered in multiple Web-based runtimes such as HTMLB, DHTML, and most notably, Adobe Flash.

As a result, you decide to quickly create a model of a Web cockpit in Visual Composer. Using the BI JDBC connector as part of UDI, external data is retrieved and pulled into the model along with the SAP NetWeaver BI data. All of the graphs, charts, and summarized information is added to the model with drag-and-drop ease and is then published via Adobe Flash to SAP NetWeaver Portal. In addition, forms can be created for entering corrective actions and are written back to a data mart for tracking. The BSP of the CPM application is created as an iView within the portal and is added to the Web cockpit. The management team is wowed by animated charts and graphs; high-quality, integrated data; and the ability to add their managerial insights as corrective actions into the analytic application itself.

Conclusion

As the world of innovation spins its tighter cycles, we can count on a couple of things: Business needs and their correlating reporting requirements will constantly change, and SAP will follow with a response, continuing to grow and mature its BEx Suite, as well as new technologies to help you get reports and analytics to the users that need them.

BEx, including the Report Designer and Web Application Designer tools, is available with SAP NetWeaver 2004s. While Visual Composer version 7 is currently in Ramp-Up to select customers, general availability is scheduled for Q3 2006 and is included in Patch 8 of the 2004s release of SAP NetWeaver Portal.

In the meantime, for those savvy users who want to preview Visual Composer's capabilities for development in general, please visit **www.sdn.sap.com/ irj/sdn/developerareas/xapps**. Here you can download an earlier version of Visual Composer for a test drive. ◻

Scott Cairncross is a senior consultant with the SAP NetWeaver Regional Implementation Group (RIG) Americas. Scott specializes in SAP NetWeaver BI and Business Planning. He has been working extensively with SAP NetWeaver BI analytics in the area of the SAP NetWeaver Visual Composer. Scott has also worked a great deal with SAP NetWeaver's Master Data Management solution. He has participated in multiple go-lives and has spoken at SAP TechEd, SAP Forum, ASUG, and the SAP NetWeaver/BI and Portals conference. Scott is also very strong in the area of custom development (ABAP). He can be reached at scott.cairncross@sap.com.

Prakash Darji started his career in operations planning and manufacturing and later moved to plant maintenance. Prakash began working with SAP technology in 1999 and joined SAP in 2004 as a BW applications consultant. At SAP, Prakash has worked on numerous projects, including Portal, SAP Analytics, Java applications, .NET connectivity, and SAP NetWeaver integration strategies. He has been published in *BW Expert* and on the SAP Developer Network (SDN). He is currently a member of the SAP NetWeaver Integration Regional Implementation Group (RIG). You can contact him at prakash.darji@sap.com.

Derek Johnson is a platinum consultant in SAP America, Inc.'s SAP NetWeaver National Competency Center. He has been working with SAP for more than eight years with a primary focus on SAP NetWeaver BI and Visual Composer. His specific experience includes data modeling, performance tuning, InfoHub, CRM analytics, Web reporting, UI patterns, information broadcasting, SEM-CPM, ABAP, and JavaScript. He holds a bachelor's degree in engineering from the University of Michigan, a master's degree in engineering from Wayne State University, and a master's degree in management information systems from Case Western Reserve University. You may contact him at derek.l.johnson@sap.com.