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The Forrester Wave™: Enterprise Business Intelligence Platforms, Q3 2008

by Boris Evelson

for Information & Knowledge Management Professionals

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IBM Cognos, Oracle, SAP Business Objects, and SAS Lead The Market

by Boris Evelson
with Connie Moore, James Kobielus, Rob Karel, and Norman Nicolson

EXECUTIVE SUMMARY

In Forrester's 151-criteria evaluation of enterprise business intelligence (BI) platform vendors, we found that IBM Cognos and SAP Business Objects maintain their leadership positions, while Oracle and SAS Institute move into leadership positions in enterprise BI thanks to the richness of their functionality, ability to scale, and the completeness of their corporate and product vision and strategy. Actuate, Information Builders, Microsoft, MicroStrategy, SAP, and a new entrant, TIBCO Spotfire, came out as Strong Performers following very closely on the heels of the Leaders, offering very respectable alternatives and a multitude of choices for information and knowledge management (I&KM) professionals. New entrants to this Forrester Wave™ evaluation of enterprise BI platforms (though not new to the market) are Panorama Software and QlikTech, who, while lacking the breadth of features to qualify them as single, large-enterprise BI solutions, are reputable Contenders. In some very specific BI use cases, they even outperform the Leaders.

TABLE OF CONTENTS

NOTES & RESOURCES

Forrester conducted lab-based evaluations in March 2008 and interviewed 12 vendors and 24 user companies, including Actuate, IBM Cognos, Information Builders, Microsoft, MicroStrategy, Oracle, Panorama Software, QlikTech, SAP, SAS Institute, and TIBCO Spotfire.

Related Research Documents

"Many Users Are Satisfied With Product Offerings From Mainstream BI Vendors"
June 12, 2008

"It's Time To Reinvent Your BI Strategy"
October 23, 2007

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BI PROVIDES A MAJOR COMPETITIVE DIFFERENTIATOR

No one said it better than a C-level business executive from the travel and entertainment industry:

> "I do not want IT solutions to be just about productivity and efficiency gains. If we are not productive and efficient at this point, we are in the wrong business. I need my IT colleagues to be real business partners and bring solutions that will enable our company to win new business, convert more prospects to customers, increase our market share, and get into the new markets. I need IT to be a true business partner, not a cost center."

This is so true in today's economy: With most products and services being highly commoditized, more and more businesses are competing on analytics. Getting better insight from information based on richer data sets, more complex models, or even making the same decisions as everyone else but before everyone else makes them — this is how most advanced enterprises compete in today's world. Business intelligence tools and technologies form the major components of the foundation that supports and enables such competitive differentiation.

Business Intelligence Is Not Just For Reporting Anymore

Contrary to the common misconception, BI enables more than just reporting and analytics. Forrester defines BI as:

> *A set of methodologies, processes, architectures, and technologies that transform raw data into meaningful and useful information used to enable more effective strategic, tactical, and operational insights and decision-making.*

BI requires many different components — sometimes more than 40 — to deliver large enterprise-grade, scalable, robust, secure, and function-rich BI environments (see Figure 1). While this Forrester Wave evaluation places heavy emphasis on the reporting, analytics, and information delivery layers of the BI architectural stack, it also addresses dependencies on all the other components like data discovery, integration, and data quality management. Reporting is just the tip of the iceberg.[1]

The BI market, while consolidating, is far from being mature. Contrary to popular belief, this vibrant market continues to evolve across multiple dimensions. We are currently on the cusp of a next-generation BI with different user interfaces, integration with process and rules, end-user self-service, alternative analytical DBMS technologies, and many others. Therefore, the core components of BI — enterprise reporting and analytics — now expand into the following eight major BI product functionalities:

- **Production/operational reporting for pixel-perfect mass report distribution.** No matter how much BI self-service end users request, good old-fashioned report development tools — mainly

used by professional programmers — remain at the heart of a BI product line. While these tools may also be used to analyze data and produce visual dashboards, they are primarily used for mass distribution of very sophisticated reports like customer statements. Requirements for these products often include pixel-perfect positioning of data and graphics, a scripting language equal in power to a full programming language, and the ability to handle complex headers, footers, nested subtotals, and multiple report bands on a single page.

- **Ad hoc query tools provide a quick answer to a business question.** When report formatting or distribution is not a requirement, and an I&KM professional just needs a quick answer to a business question like, "How many units of a product were sold yesterday across all stores and outlets?" or, "What were my total sales in 2007 in North America?" simple ad hoc query tools with an intuitive point-and-click user interface (UI) are the way to go.

- **OLAP tools, when business questions are more about "whys" than "whats".** While reporting and ad hoc query tools are typically used to answer the questions like "What happened?" and "When and where did it happen?", online analytical processing (OLAP) tools are used to answer the questions like "Why did it happen?" and also to perform "What if?" analysis. Otherwise known and "slicing and dicing" analysis (essentially a spreadsheet pivot table on steroids), OLAP tools allow a power user to see any facts (numerical, typically additive numbers, like transaction amounts and account balances) almost instantaneously regrouped, re-aggregated and resorted by any dimension (descriptive elements like time, region, organizational unit, or product line).

- **Dashboards as an interactive, visual UI — not a reporting or analytical tool by itself.** Dashboards should be used as a UI to operational or analytical information. Designed to deliver historical, current, and predictive information typically represented by key performance indicators (KPIs), dashboards use visual cues to focus user attention on important conditions, trends, and exceptions.[2] The term "dashboard" is often used synonymously with "scorecard," but Forrester defines a scorecard as just one type of a dashboard that links KPIs to goals, objectives, and strategies. Many scorecards follow a certain methodology, such as Balanced Scorecard, Six Sigma, Capability Maturity Models, and others.[3] Other dashboard varieties include business activity monitoring (BAM) dashboards and visualizations of data/text mining operations.

- **BAM to report on real-time data and process information streams.** While a dashboard can be used as a graphical UI (GUI) component, business activity monitoring (BAM) also captures data and process events (e.g., number of credit applications processed today and number still pending in a queue), correlates and aggregates them into business metrics (e.g., ratios of processed, approved, and rejected applications per hour), and displays the real-time status of the metrics and trailing patterns.

- **Predictive modeling answers questions about what's likely to happen next.** Using various statistical models, these tools attempt to predict the likelihood of attaining certain metrics in the future, given various possible existing and future conditions. One typical predictive modeling class is called market basket analysis, which tries to predict the likelihood of a customer buying a certain product if and when he or she bought another product at a certain store at a certain season, date, and time, given certain economic conditions such as interest rates and price of gas.

- **BI workspaces enable true end user self-service.** While most BI environments attempt to address end user self-service requirements, they still impose many restrictions, such as fixed data models, an inability to add new dimensions on the fly, and sometimes restricted access to production data. Forrester defines a BI workspace as a data exploration environment where a power user can analyze production, clean data with near complete freedom to modify data models, enrich data sets, and run the analysis whenever necessary, without much dependency on IT and production environment restrictions. Some examples of such workspaces are desktop-based multidimensional OLAP (MOLAP) cubes, in-memory data models, or BI software-as-a-service (SaaS).[4]

- **Guided BI search tools support free form ad hoc queries and analysis.** While reporting, ad hoc queries, and OLAP tools work best when one knows the exact business question, they fall short when a user is looking for something that he or she is not quite sure of. A salesperson getting ready for an important client meeting may not know all of the information required to prepare for the meeting and may not be able to effectively construct the appropriate queries to pull the information she might need. What works much better is enabling this salesperson to simply enter a few keywords to find relevant customer dimensions in the database, then using a graphical interface to drill into the information she wants from a list of possibilities. This effectively solves one of the oldest dilemmas in BI: having to know exactly which questions to ask to get a meaningful answer.[5]

Figure 1 Business Intelligence Architectural Stack

	Apps	Form factor	PSO
Delivery — Desktop gadgets / Office suites / Mobile / Disconnected; Portals / Interactive voice response, ATM, point-of-sale	Industry vertical applications	Appliance	Strategy
Reporting — Dashboards / Alerts / Advanced data visualization; Search / Geospatial / Reporting — ad hoc, analytical, production			
Performance management — Metrics/KPIs / Planning / Scorecards; Strategy/objectives management			SI
Supporting applications — Collaboration / Life-cycle mgt. / Localization / QA / Version control; Metadata — integration, repositories / ECM / eLearning / MDM			MSP/application outsourcing
Analytics — Data/text mining / Guided decisions / NLP / Guided search; Time series / OLAP / Operational DSS / Predictive analytics; Usage analytics / Statistical analysis / Web analytics	Enterprise applications: ERP, CRM, SCM, ERM	BI SaaS	
Discovery and integration — Accelerators/query optimization / Adapters/tool kits; BAM/CEP / BPM/BRE integration / Discovery accelerators; DQ — cleansing, profiling / EAI/SOA / EII / ETL/CDC; Integration — third-party applications; Operational data stores (ODS), data warehouses (DW), data marts (DM); Report mining / Services registry and repository			Center of excellence
Data — Columnar DBMS / Hierarchical/XML / In-memory DBMS; Multidimensional OLAP / Multivalue DBMS / RDBMS; Streaming DBMS / Search DBMS		Hosted BI (ASP)	BPO
Infrastructure — Network / Servers / Storage			

(PSO column also includes Methodology and Governance)

44724   Source: Forrester Research, Inc.

ENTERPRISE BI PLATFORMS EVALUATION OVERVIEW

To assess the state of the enterprise business intelligence platforms market and see how the vendors stack up against each other, Forrester evaluated the strengths and weaknesses of top business intelligence vendors.

Evaluation Criteria: Current Offering, Strategy, And Market Presence

After examining past research, user need assessments, and vendor and expert interviews, we developed a comprehensive set of evaluation criteria. We evaluated vendors against 151 criteria, which we grouped into three high-level buckets:

- **Current offering.** To assess product strength, we evaluated each offering against four groups of criteria: architecture, development environment, and functional and operational capabilities.

- **Strategy.** We reviewed each vendor's strategy and considered how well each vendor's plans for product enhancement position it to meet future customer demands. We also looked at the financial and human resources the company has available to support its strategy, and its go-to-market pricing and licensing strategy.

- **Market presence.** To establish a product's market presence, we combined information about each vendor's financial performance, installed customer base and number of employees across major geographical regions, its partnership ecosystem, as well as horizontal and vertical industry applications.

Evaluated Vendors Must Meet Architecture, Functionality, and Scalability Criteria

Forrester included 12 vendors in the assessment: Actuate, IBM Cognos, Information Builders, Microsoft, MicroStrategy, Oracle, Panorama Software, QlikTech, SAP Business Objects, SAP, SAS Institute, and TIBCO Spotfire. Each of these vendors has (see Figure 2):

- **At least three out of the four major functional BI components.** Even though we mention eight components in our tool evaluations, we only included vendors that have at least three of the following major components that are at the very least necessary for large enterprise BI environments: production/operational reporting, ad hoc querying, OLAP, and dashboards.

- **The ability to query databases using SQL and MDX.** While other querying technologies such as XQuery and DMX are available, SQL and MDX are used most widely in large enterprises.

- **A self-contained, complete, fully functioning BI environment.** We focused on generic BI tools, not technologically or functionally tied or limited to particular functional/horizontal applications (ERP, SCM, etc.). These tools must be self-contained, complete BI environments or platforms that do not have to be necessarily embedded in other applications.

- **Sufficient market presence and interest from Forrester clients.** We included vendors with least 100 in-production customers present in more than one major geographical region, with more than 10% enterprise-grade, cross-line-of-business installations with more than 100 users. We also focused on vendors Forrester clients frequently mentioned or asked about in the context of business intelligence.

- **Significant BI revenues.** Finally, we focused on vendors with at least $40 million in BI revenues.

Figure 2 Evaluated Vendors: Product Information And Selection Criteria

Vendor	Product(s) evaluated	Product version evaluated	Version release date
Actuate	e.Reports; e.Spreadsheets; BIRT	9	June 2006
IBM Cognos	IBM Cognos 8 Business Intelligence Platform	8.3	January 2008
Information Builders	WebFOCUS	7.6	May 2007
Microsoft	SQL Server 2005	SP2	November 2005
MicroStrategy	MicroStrategy	8.1.1	September 2007
Oracle	BI Suite Enterprise Edition Plus; Hyperion Essbase	10.1.3.3	October 2007
Panorama Software	NovaView	5r2	November 2007
QlikTech	QlikView	8.2	January 2008
SAP Business Objects	SAP Business Objects XI	XI R2	March 2006
SAP	SAP NetWeaver BI	7.0	November 2007
SAS Institute	SAS BI	9.1.3	March 2006
TIBCO Spotfire	Spotfire DXP	2.0	July 2007

Vendor selection criteria

Does the vendor's product have at least three out of the four major functional BI components?
Does the vendor have the ability to query databases using SQL and MDX?
Does the vendor offer a self-contained, complete, fully functioning BI environment?
Does the vendor have sufficient market presence and interest from Forrester clients?
Does the vendor have at least $40 million in BI revenues?

Source: Forrester Research, Inc.

ENTERPRISE BI CHOICES AND DIFFERENT APPROACHES ARE STILL PLENTIFUL

The evaluation uncovered a market in which (see Figure 3):

- **IBM Cognos and SAP Business Objects continue to lead the pack.** Even though IBM Cognos and SAP Business Objects scored very closely, they offer very different approaches to enterprise BI platforms. SAP Business Objects believes that enterprises need the best BI tool for every use case, sometimes even at the expense of less-than-complete integration. As a result of such strategy, the company went on a spree of acquiring and building many different BI tools over

the past few years and ended up with one of the richest BI portfolios on the market in its XI release. IBM Cognos, on the other hand, offered a different philosophy: It believed that a unified, integrated platform is preferable, even if it did not address every single BI function and feature end users wanted. Rather than acquiring multiple technologies, IBM Cognos completely rebuilt its architecture in release 8, falling a bit behind SAP Business Objects in functionality but leading in modern unified architecture.

· **Oracle and SAS Institute move into leadership positions.** Indicating that many large enterprise-grade BI vendors now "get it," we expect more and more vendors to accumulate enough functionality to qualify for leadership positions. Oracle moves into the leadership category as it enriches its BI portfolio, and the company brings the best of its recently acquired technologies from Siebel and Hyperion into Enterprise Edition Plus. SAS also becomes a leader by continuing to build on its amazing 32-year success story of uninterrupted growth. SAS remains the best game in town for fully integrated high-end analytics from a single vendor.

· **Information Builders, Microsoft, and SAP offer competitive options.** Just looking at this list, I&KM pros can rest assured that contrary to some market consolidation trends, respectable and rich BI alternatives abound. Information Builders shines with continued innovation, comparable to much larger BI vendors, and the most comprehensive information access adapters, easily connecting a large number of very heterogeneous data sources including legacy mainframe databases. Microsoft is becoming enterprise-grade with dizzying speed, and the market penetration of key BI components like SharePoint and SQL Server Analysis Services is hard to ignore. SAP NetWeaver BI offers a unique BI Accelerator appliance, addressing some current performance issues. While its portfolio of BI products is still best for SAP environments, the Business Objects acquisition and the converged product road map will change that equation over the next 12 months.

· **Actuate, MicroStrategy, and TIBCO Spotfire go after best-of-breed components.** There are more choices still, especially when all one is looking for are best-in-class reporting and analytical tools, and integration with the rest of the BI stack components is less of an issue. Actuate continues to differentiate with a sophisticated production report development environment, offers a unique e.Spreadsheet report delivery option, and is becoming more and more attractive to enterprises seeking to leverage open source alternatives. MicroStrategy still outperforms the competition with a truly unified platform and the top ROLAP engine, which is very competitive — especially in environments with multiterabyte data warehouses or poorly architected or optimized reporting databases. TIBCO, a recent entrant into the BI market with the acquisition of Spotfire, leverages its long history of success and expertise in middleware for integrating visual information analysis with process orchestration and business rules.

· **Panorama Software and QlikTech still lack breadth, but they shine in specific use cases.** Even though Panorama Software and QlikTech lack the breadth of options and features needed to

be all-encompassing enterprise BI solutions, they offer highly differentiated tools for certain specific BI use cases. Panorama Software is a great option when 100% of the analysis is done on OLAP databases, and there's no need to muddle the waters with other tools and overlapping, sometimes redundant, functionality of SQL- and MDX-based data access. QlikTech and TIBCO Spotfire invented "BI without borders" — lightning-fast access to large in-memory data models, where recalculations, re-aggregations and what-if analysis can be performed with few limitations. In-memory architectures do not require prebuilt data models, so any element can be re-examined as a fact or a dimension on the fly.

This evaluation of the enterprise BI platforms market is intended to be a starting point only. We encourage readers to view detailed product evaluations and adapt the criteria weightings to fit their individual needs through the Forrester Wave Excel-based vendor comparison tool.

Figure 3 The Forrester Wave™: Enterprise Business Intelligence Platforms, Q2 '08
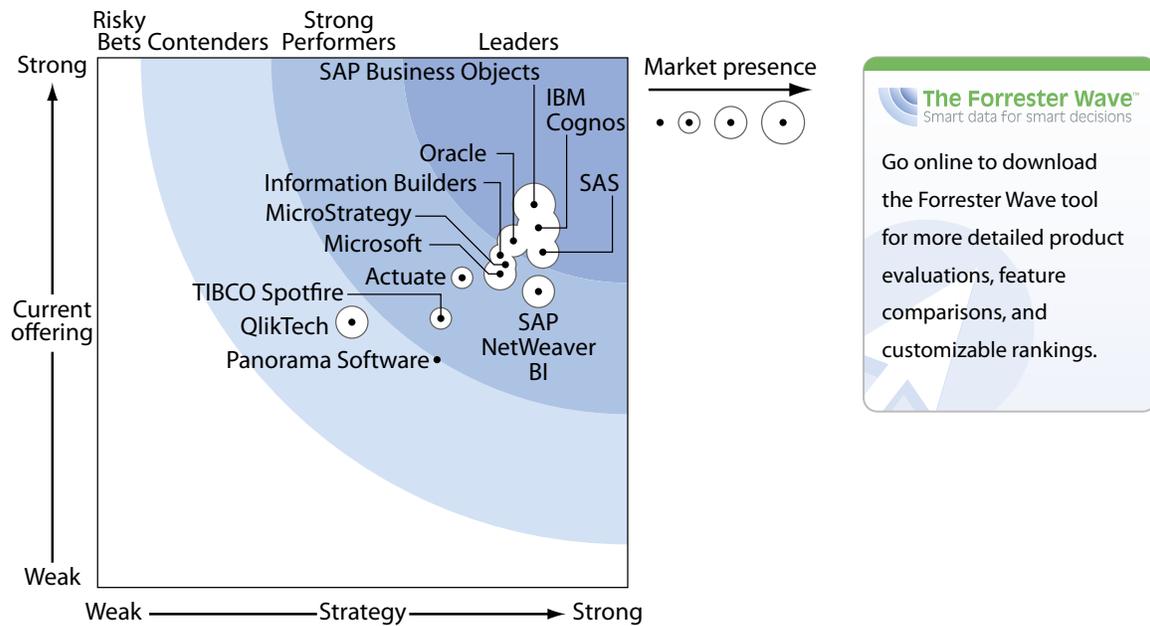
Source: Forrester Research, Inc.

Figure 3 The Forrester Wave™: Enterprise Business Intelligence Platforms, Q2 '08 (Cont.)

	Forrester's Weighting	Actuate	IBM Cognos	Information Builders	Microsoft	MicroStrategy	Oracle	Panorama Software	QlikTech	SAP Business Objects	SAP NetWeaver BI	SAS Institute	TIBCO Spotfire
CURRENT OFFERING	50%	2.90	3.37	3.11	2.94	3.04	3.25	2.16	2.48	3.59	2.77	3.15	2.52
Architecture	35%	2.86	3.66	3.64	2.87	3.34	3.59	1.85	2.12	3.89	2.86	3.44	2.11
Development	15%	4.10	3.05	2.45	2.75	3.10	1.95	2.05	2.90	3.75	2.15	2.95	2.55
Functional	35%	2.48	3.25	2.98	3.06	2.66	3.55	2.25	2.67	3.37	2.88	3.21	2.87
Operational	15%	2.77	3.29	2.82	3.04	3.18	3.02	2.77	2.45	3.25	2.93	2.55	2.63
STRATEGY	50%	3.44	4.16	3.80	3.80	3.84	3.92	3.24	2.40	4.12	4.16	4.20	3.24
Commitment	40%	3.50	3.50	3.50	3.50	4.50	3.50	3.00	1.50	4.00	3.50	4.50	3.00
Pricing and licensing	0%	2.64	2.16	3.44	1.64	3.04	2.92	3.28	3.56	2.28	1.60	2.84	3.24
Product direction	60%	3.40	4.60	4.00	4.00	3.40	4.20	3.40	3.00	4.20	4.60	4.00	3.40
MARKET PRESENCE	0%	2.12	4.68	2.70	3.77	2.62	3.67	1.68	3.07	4.45	3.90	3.21	2.30
Company financials	20%	2.50	3.70	3.10	2.80	3.10	2.80	1.20	3.40	3.70	2.50	4.30	3.40
Global presence	15%	4.40	5.00	4.40	5.00	4.40	4.40	3.60	3.60	4.40	5.00	5.00	5.00
Partnership ecosystem	15%	2.00	5.00	2.00	4.00	2.00	5.00	2.00	3.00	5.00	5.00	2.00	1.00
Install base	40%	1.50	5.00	2.50	4.50	2.00	3.00	1.50	3.50	5.00	3.50	2.00	1.50
Functional applications	10%	0.60	4.40	1.20	0.60	2.40	5.00	0.00	0.00	3.00	5.00	5.00	1.20

All scores are based on a scale of 0 (weak) to 5 (strong).

Source: Forrester Research, Inc.

VENDOR PROFILES

Leaders: One-Stop BI Shopping Addresses Most Requirements For Full BI Functionality

Most large enterprise BI vendors finally "get it" and offer robust, scalable, well-integrated BI platforms with rich and broad BI functionality. Not all solutions are created equal, however, and the lines of demarcation for shortlisting vendors are still pretty apparent: rich functionality versus integrated platform; suite versus best-of-breed; stack-integrated versus stack-independent tool set; more expensive solutions offering near 100% functionality versus less expensive ones following the 80/20 rule; and many others. One fact remains clear and undisputed: Architecting and implementing enterprise BI solutions is still a complex and costly endeavor, and the goal of plug-and-play, or out-of the-box, BI solutions remains elusive.

- **Business Objects, an SAP company, provides some of the best-in-class tools for each use case.** Business Objects offers a very rich set of mature BI products, and it is also one of the very few vendors offering a complete BI solution including data integration, data quality, and text

analytics products. One of the main advantages of implementing the entire suite of products from SAP Business Objects is that end-to-end data lineage and impact analysis become a no-brainer. There's indeed a best-in-class tool for every use case: Crystal for production reporting, WebIntelligence for ad hoc querying, Voyager for OLAP, Polestar for guided BI search, Xcelsius for interactive dashboards, and several more. Most of the tools are also available as a virtual appliance for easy procurement, installation, and configuration.

These significant benefits do come with a price, however. While release XI is a huge step in the right direction, plenty remains to be done. Top priorities for SAP Business Objects include bringing all SAP Business Objects products into a common platform for improved security and administration, integrating the multiple products enabling easier interchange of all metadata, and migrating from one product to another — all of which could require a significant rewrite effort. Having said that, Business Objects' suite of products is front and center in the combined SAP and Business Objects future product road maps. Even though SAP has no significant prior experience in integrating large acquisitions, so far most merger integration is going well.[6] We expect Business Object's products to benefit significantly from the infusion of SAP's resources, technologies, and deep industry expertise.

- **IBM Cognos provides one of the most modern and scalable BI environments.** Cognos spent the past few years concentrating on unified platform and integrated product lines. Starting with release 8, its BI suite is 100% J2EE-based and provides a common UI for most of the products. Even though IBM Cognos may not have as many bells and whistles as its top competitor SAP Business Objects, product integration is much less of an issue. Any report or dashboard developed in Query Studio or Analysis Studio can always be easily migrated to Report Studio, the higher-end product. IBM Cognos also tries to make it as easy as possible for its customers to migrate applications from one environment to another (development to test to production, for example) with a rich set of impact analysis utilities. Unlike SAP Business Objects, which chose not to have its own OLAP engine, IBM Cognos has two: PowerCube and an in-memory OLAP TM1. IBM Cognos is also one of the few BI vendors that offer a fully integrated BAM appliance: the IBM Cognos Now! product.

While the IBM merger may change this in the near future, Cognos relies heavily on partners to deliver complete end-to-end BI solutions, which include data integration, data quality, and text analytics products from partners. As a result, enterprise IT pros or systems integrators (SIs) still need to assemble components from several vendors. Post-merger integration with IBM is proceeding well. Cognos benefits from the infusion of financial and human resources from IBM, and since the two companies did not have many overlapping products, most of the combined efforts are concentrating on improvements in functionality, rather than reconciliation of competing technologies.[7]

- **SAS is the best one-stop BI shop that includes high-end analytics from a single vendor.**
  Similar to SAP Business Objects, SAS Institute is another vendor that offers nearly complete
  BI solution including data integration, data quality (via its DataFlux subsidiary), text analytics,
  and statistical analysis tools, all bundled together. Even though several other vendors realize or
  are starting to realize the value of providing higher-end analytics tools like statistical analysis
  and predictive modeling, SAS is pretty hard to beat in this category, especially when it comes
  to embedding such analytical routines in powerful DBMS engines like Teradata. SAS also
  continues to differentiate itself in many areas of functional subject-matter expertise, including
  but not limited to areas like marketing analytics and risk management. Advanced features
  for SAS BI and advanced analytics still work best in environments comfortable with the use
  of its powerful SAS programming language, although with every new release, more and more
  features are becoming available in the SAS point-and-click GUI, such as its very popular
  Enterprise Guide product. We see no reason SAS can't continue on its amazing track record of
  uninterrupted 32-year growth.

- **Oracle brings the best of its rich BI portfolio into Enterprise Edition Plus.** Oracle's BI
  portfolio is very diverse, but the strategic products concentrate in the Enterprise Edition (EE)
  Plus suite, which includes technologies acquired from Siebel and Hyperion. Oracle BI EE is
  very rich in features and functions and scores very close to the leading BI vendors. The BI suite
  includes a powerful BI Server with a ROLAP engine and enterprise information integration
  (EII) technology, qualifying Oracle's BI suite as a heterogeneous, not just Oracle-centric, BI
  platform. Even though Oracle continues to support all products it has acquired, Essbase
  is the key Hyperion product that will receive the most attention and R&D dollars. Essbase
  continues to be one of the leading OLAP engines on the market and a preferred tool of finance
  departments all over the world. We expect Oracle to continue to acquire companies in the areas
  where it still heavily relies on partners, such as data quality. Oracle's main BI challenge will
  continue to be a fine balancing act: supporting multiple redundant and overlapping products
  versus bringing the strategic products closer together and integrating the platform, UI, and
  other core features.[8]

Strong Performers: Still Plenty Of Options For Discerning BI Users

Market Leaders cannot rest easy — there are still several very Strong Performers out there. These
vendors continue to offer very respectable alternatives for BI users, sometimes even bypassing the
Leaders in certain BI components. Choices for enterprise BI buyers are still plentiful.

- **SAP NetWeaver BI is still best in SAP shops, but Business Objects will change all that.** SAP
  BI version 7 is a more modern and stable suite of products than previous versions. It can even be
  architected for high performance, especially if coupled with its unique BI Accelerator appliance.
  Even though Visual Composer can be used to design any BI application, and Virtual InfoCubes
  can point to data in non-SAP sources, SAP BI still works best when it can leverage the rich

functionality of SAP ERP applications. SAP is also very well known for its deep subject matter expertise in multiple industry vertical applications, and enterprises that don't have such domain knowledge in-house can leverage of the many years of best practices that SAP has accumulated in many different industries. Since the converged company product road map places heavy emphasis on the Business Objects product suite, SAP BI customers need to start making plans to upgrade and convert to the new product line when SAP products like Business Explorer and Web Application Designer start going into maintenance mode sometime in 2009.

- **Information Builders continues to innovate, offering the most extensive data access adapters.** Similar to much larger vendors, Information Builders is getting as close as possible to crossing every "t" and dotting every "i" when it comes to a function-rich, complete BI solution. When compared with vendors closer to its size, Information Builders offers more advanced features such as guided BI search (Magnify) and seamless offline usage (Active Reports). In the future releases of WebFOCUS, Information Builders is also addressing a popular client demand to bundle statistical analysis and predictive modeling in the BI environment, and it will integrate the open source R statistical package.[9] And no one comes close to Information Builders subsidiary iWay Software in providing the most extensive set of data and application adapters — in fact, many other BI vendors OEM iWay Software adapter libraries.[10]

  WebFOCUS still works best in environments comfortable with the use of its powerful FOCUS programming language, although with every new release, more and more FOCUS features are becoming available in the WebFOCUS point-and-click GUI. We will not be surprised if Information Builders finds creative ways to address every single BI component in the near future, but today it still does not deliver complete end-to-end BI solutions, so buyers will need to look to partners to get data quality, master data management, and other key components of the BI stack.

- **MicroStrategy still shines as a truly unified platform with the top ROLAP engine.** MicroStrategy, one of the few BI vendors that have not acquired any technologies, developed 100% of its products in-house and as a result offers a truly unified platform. What it means is something few other BI vendors can offer: You can define any object (a prompt, a filter, etc.) only once and reuse it in multiple reports and dashboards. When you need to change that object, you change it only in one place. Also, unlike many other BI vendors that rely mainly on the power of the underlying DBMS, MicroStrategy offers its own very powerful ROLAP engine, which can virtually optimize even poorly architected data models.

  While many other BI vendors partner with third-party providers for higher-end analytics such as statistical analysis and predictive modeling, MicroStrategy has such functionality built in and fully integrated. The price: It is not MicroStrategy's strategy to address BI components other than enterprise reporting and analytics, and the company will continue to rely heavily on partners to deliver complete end-to-end BI solutions. As a result, MicroStrategy buyers often need to assemble components from other vendors.

- **Microsoft is becoming enterprise-grade with dizzying speed.** While Microsoft's BI offering was mostly the realm of smaller enterprises and very Microsoft-centric environments in the past, that is all changing. As Microsoft continues to pour its significant funds and resources into SQL Server, and the gap in functionality between Microsoft BI and vendors with more years of BI experience continues to narrow, it will be harder and harder for I&KM professionals not to shortlist Microsoft BI as one of the options on the table. The bottom line is that most enterprises — whether they know it or not —have SQL Server somewhere in their organization, and therefore already own a large portion of Microsoft BI tools, which includes one of the most widely used OLAP engine with a highly useful ROLAP/MOLAP real-time tuning feature.[11] Even more important, Microsoft BI really differentiates itself where many other BI vendors fail: The entire BI development environment is tightly integrated with Microsoft Visual Studio, a popular integrated development environment (IDE).

  Microsoft BI is still somewhat Microsoft-centric as the environment can only be developed and used on Microsoft platforms, and it works best when used with the other Microsoft products like PerformancePoint for rich GUI and SharePoint as a portal. While Microsoft continues to round out its BI portfolio, today it still relies heavily on partners to deliver complete end-to-end BI solutions, which include data quality and text analytics products from partners.[12] Consequently, enterprises still need to put together components from several vendors for a complete solution.

- **Actuate still differentiates on a sophisticated production report development environment.** Actuate intends to remain a leader in several key BI categories. First it offers an extremely scalable environment for complex report development and mass report distribution, especially outside of a firewall. Such functionality becomes extremely important when one needs to distribute interactive online reports, like customer statements, to millions of customers. Rather than creating, maintaining, and distributing millions of individual reports, Actuate's approach is to create a single report, where each customer can only access its own section — a much more elegant solution. Actuate also has a highly differentiated e.Spreadsheet product, the only product on the market where truly 100% of Excel features and functionality are preserved and exploited in complex report development and delivery (e.g., automatically generating a new worksheet tab for a new time period).

  Actuate is also one of the main sponsors of the Eclipse Business Intelligence and Reporting Tools (BIRT) project and offers an interesting alternative for customers who want to experiment and start with a no-cost open source BI solution and then graduate up to a scalable fully licensed option.[13] On the other hand, Actuate does not plan to compete in the OLAP space, and it offers only a very lightweight (browser-based) analytics product. It is also not Actuate's strategy to address BI components other than enterprise reporting, and it will continue to rely heavily on partners to deliver complete end-to-end BI solutions, which always need to include data

integration, data quality, analytics, and other products from partners. As a result, when using Actuate products, enterprise IT or SIs need to cobble together components from several vendors.

- **TIBCO Spotfire differentiates with visualization and integration with process and rules.** While many BI vendors talk about enterprise optimization or enterprise decision management that can only be enabled through seamless convergence of BI, business process management, and business rules engines, the TIBCO Spotfire team is actually implementing such solutions today.[14] Its Operations Analytics bundle can display data and process metrics and let an end user correct rules and process flows if necessary. Users can even see the updated results in real time. This is also partially possible by Spotfire's powerful in-memory analytical engine, which, similar to QlikTech, can update results in memory with lightning speed. Furthermore, Spotfire continues to build on its original strength and differentiation: advanced data visualization functionality that helps analysts identify data characteristics and trends based simply on visual pattern recognition.[15] TIBCO is very serious about BI, and we expect more acquisitions or more internally developed products to round out its BI portfolio in the near future. Today, however, it continues to rely heavily on partners to deliver complete end-to-end BI solutions, which always need to include data quality and other products from partners.[16]

Contenders: Interesting Alternative Approaches For Specific BI Use Cases

It's not the strategy of smaller BI vendors like Panorama Software and QlikTech to address BI components other than reporting and analytics. Until they get acquired (which is almost inevitable) these vendors will continue to rely heavily on partners to deliver complete end-to-end BI solutions with data integration, data quality, and other BI stack component providers. However, these smaller BI vendors also continue to demonstrate that there are still plenty of opportunities to innovate in the vibrant BI market segment, which is quite far from maturing and commoditizing.

- **Panorama Software is a great option when all you need is MDX.** It's a huge credit to such a small company that two industry giants — Microsoft and Google — have Panorama Software code inside of their BI solutions. At the core of Microsoft SQL Server Analysis Services lies an OLAP engine acquired from Panorama, and Google is making an entry into BI SaaS by embedding some Panorama OLAP functionality into its Google Docs.[17] While Panorama Software does not have the breadth of functionality necessary to be the only enterprise BI solution, if all you need to do is run reports and analysis on OLAP databases (Microsoft Analysis Services, SAP BW, Oracle Essbase, or open source Mondrian), Panorama's NovaView product offers a respectable option, with intuitive UI and highly optimized MDX-based OLAP engine access. When all you need to do is OLAP, it's hard to beat the MDX optimization, experience, and best practices that Panorama Software has accumulated over the years.

- **QlikTech popularizes "BI without borders."** No matter what BI architecture or solution one chooses, a data modeling step is still required before reporting and analysis can be performed. In-memory data models from QlikTech (and TIBCO Spotfire) do not require

that precondition, since all calculations and aggregations can be done at RAM speeds and therefore require little, if any, design and preparatory work. There are times when one needs to treat a continuously variable numerical value (like sales price) not as fact, but as a dimension. While conventional OLAP tools make this very difficult, in-memory models do not require a distinction between facts and dimensions — any element can be instantaneously used in either capacity. QlikTech spent years optimizing memory utilization and now can take full advantage of 64-bit architectures with in-memory models as big as a terabyte (as opposed to the 4 gigabyte limitation of 32-bit computers). While QlikTech does not have the breadth of functionality necessary to be the only enterprise BI solution, its lightning-fast response times for instant exploratory analysis and what-if scenarios, including on-the-fly re-aggregations, can be very attractive to power users and analysts.

SUPPLEMENTAL MATERIAL

Online Resource

The online version of Figure 3 is an Excel-based vendor comparison tool that provides detailed product evaluations and customizable rankings.

Data Sources Used In This Forrester Wave

Forrester used a combination of these data sources to assess the strengths and weaknesses of each solution:

- **Hands-on lab evaluations.** Vendors spent one day with a team of analysts who performed a hands-on evaluation of the product using a scenario-based testing methodology. We evaluated each product using the same scenario(s), creating a level playing field by evaluating every product on the same criteria.

- **Vendor surveys.** Forrester surveyed vendors on their capabilities as they relate to the evaluation criteria. Once we analyzed the completed vendor surveys, we conducted vendor calls where necessary to gather details of vendor qualifications.

- **Customer reference calls.** To validate product and vendor qualifications, Forrester also conducted reference calls with two of each vendor's current customers.

The Forrester Wave Methodology

We conduct primary research to develop a list of vendors that meet our criteria to be evaluated in this market. From that initial pool of vendors, we then narrow our final list. We choose these vendors based on: 1) product fit; 2) customer success; and 3) Forrester client demand. We eliminate vendors that have limited customer references and products that don't fit the scope of our evaluation.

After examining past research, user need assessments, and vendor and expert interviews, we develop the initial evaluation criteria. To evaluate the vendors and their products against our set of criteria, we gather details of product qualifications through a combination of lab evaluations, questionnaires, demos, and/or discussions with client references. We send evaluations to the vendors for their review, and we adjust the evaluations to provide the most accurate view of vendor offerings and strategies.

We set default weightings to reflect our analysis of the needs of large user companies — and/or other scenarios as outlined in the Forrester Wave document — and then score the vendors based on a clearly defined scale. These default weightings are intended only as a starting point, and we encourage readers to adapt the weightings to fit their individual needs through the Excel-based tool. The final scores generate the graphical depiction of the market based on current offering, strategy, and market presence. Forrester intends to update vendor evaluations regularly as product capabilities and vendor strategies evolve.

ENDNOTES

[1] Business intelligence sits at the top of the IT priority list for many enterprises. Enterprises that haven't paid enough attention now see a need to act, and those that have kept up with BI want to consolidate their siloed implementations. The promises of BI attract any organization, but how do you get started? Enterprises face multidimensional choices, and they cannot start with vendor selection. Tasks like data governance, matching requirements with logical architectures, and picking an experienced architect and implementer should be at the top of the list. See the October 23, 2007, "It's Time To Reinvent Your BI Strategy" report.

[2] Dashboards are increasingly popular as a favorite management tool to measure and analyze past and present performance and potentially discover trends that provide insight into the future. However, dashboards are just the tip of the iceberg of business intelligence, which is a set of methodologies, processes, architectures, and technologies that transform raw data into meaningful and useful information. Source: October 10, 2007, "Dashboards — Turning Information Into Decisions" teleconference (http://www.forrester.com/rb/teleconference/dashboards_%26mdash%3B_turning_information_into_decisions/q/id/2037/t/1).

[3] These scorecards and others are evaluated in the Forrester Wave evaluation of business performance solutions (BPS), in which Forrester assessed 10 leading BPS vendors across 83 criteria. Cognos, Oracle, and SAS Institute were found to lead the category with overall breadth of functionality and aggressive strategies for competing in this rapidly evolving market. Business Objects and SAP both showed strong solution functionality but have considerable work ahead to integrate recent pure-play acquisitions into more seamless BPS offerings. Clarity Systems leads the BPS pure plays with a very strong planning and budgeting solution. Applix and Longview Solutions, though lacking as much out-of-the-box functionality and scorecarding capabilities as the large vendors, made solid Strong Performer showings as well, based on their flexibility to handle unique customer requirements. Infor is also a Strong Performer with a mature BPS suite, but it needs a more aggressive strategy for competing outside of its enterprise resource planning (ERP) installed base. Microsoft's September 2007 initial release of Microsoft Office PerformancePoint Server

2007 puts it in the mix as a Strong Performer with an assertive vision and a solid technology foundation, but the solution needs to mature in terms of breadth and depth of functionality. See the October 10, 2007, "The Forrester Wave™: Business Performance Solutions, Q4 2007" report.

[4] For years, traditional business intelligence technologies have provided tools for reporting, analysis, and visualization of information. While these technologies continue to remain the core staples of enterprise-grade BI solutions, Forrester recognizes an emergence of newer technologies and approaches to analyzing data. One such approach is the "BI workspace," where power users, especially power analysts, can explore data without their IT departments imposing any limitations or constraints, such as fixed data models, security, and production environment schedules. Information and knowledge management professionals should consider adding workspace capabilities to the list of BI functions that are necessary for leading-edge BI environments. See the June 23, 2008, "BI Workspaces: BI Without Borders" report.

[5] Search and business intelligence really are two sides of the same coin. Enterprise search enables people to access unstructured content like documents, blog and wiki entries, and emails stored in repositories across their organizations. BI surfaces structured data in reports and dashboards. As the two technologies mature, the boundary between them is beginning to blur. Search platforms are beginning to perform BI functions like data visualization and reporting, and BI vendors have begun to incorporate simple-to-use search experiences into their products. Information and knowledge management professionals should take advantage of this convergence, which will have the same effect from both sides: to give businesspeople better context and information for the decisions they make every day. See the May 5, 2008, "Search + BI = Unified Information Access" report.

[6] SAP, in a complete turnaround from its prior organic growth and "tuck-in" acquisitions strategy, announced its intention to acquire Business Objects on October 7, 2007. This move parallels similar big bang acquisitions by SAP's application rival Oracle, including Oracle's acquisition of Hyperion earlier this year. It adds offerings recognized as Leaders in Forrester Wave™ evaluations for extract, transform, and load (ETL) technology, as well as business intelligence and reporting to the SAP portfolio. The deal continues the stunning consolidation in business performance solutions and business intelligence, driven by unrelenting growth of user demand for information. BI and BPS applications will remain at the front and center of enterprise strategies for performance optimization and competitive differentiation for the foreseeable future. The pending acquisition of Business Objects is an enormously complicated undertaking for SAP, however — not only culturally, but also in terms of products and partnerships. See the November 5, 2007, "SAP Changes Course With Major Acquisition" report.

[7] IBM's planned acquisition of Cognos comes as little surprise following SAP's announcement to acquire Business Objects and Oracle's recent acquisition of Hyperion. IBM's move is cleaner in terms of minimizing product overlaps than the other two, but it raises interesting questions about IBM's partner relationships and long-term strategies. Over the past six months, the markets for business intelligence and business performance solutions have consolidated rapidly as a result of significant moves by IBM, Microsoft, Oracle, and SAP, leaving few independents. Among these "big four" vendors, only IBM lacks a significant enterprise applications play, but the Cognos deal raises the possibility of IBM moving in that direction as well. Forrester believes that the BI and BPS markets will continue to consolidate around these four large

vendors but will not be commoditized anytime soon. See the December 27, 2007, "Cognos Acquisition Puts IBM In Thick Of BI Race" report.

8   With the announcement of the Hyperion acquisition, Oracle did, again, what it does best — made a bold play to absorb a key competitor's technology and customer base. While this acquisition appears to be primarily focused on Hyperion's strong financial applications business, it also significantly improves Oracle's position in business intelligence — two segments that are complementary and hot. The acquisition will increase Oracle's pressure on the remaining pure-play BI and business performance solution vendors, but even more importantly on IBM, Microsoft, and SAP. First, however, Oracle must sort out numerous product overlaps and redundancies to squeeze value from the $3.3 billion investment. See the March 19, 2007, "Hyperion Acquisition Boosts Oracle's Position In Business Performance And BI" report.

9   "R is a language and environment for statistical computing and graphics. . . . R provides a wide variety of statistical (linear and nonlinear modelling, classical statistical tests, time-series analysis, classification, clustering . . .) and graphical techniques, and is highly extensible. The S language is often the vehicle of choice for research in statistical methodology, and R provides an Open Source route to participation in that activity.

  "One of R's strengths is the ease with which well-designed publication-quality plots can be produced, including mathematical symbols and formulae where needed. Great care has been taken over the defaults for the minor design choices in graphics, but the user retains full control." Source: "The R Project for Statistical Computing" (http://www.r-project.org/)

10 iWay Software, a subsidiary of Information Builders, is best known for its world-class information connectivity and also leads all vendors in its platform support and real-time connectivity options. iWay Software's ETL product, DataMigrator, offers a less functional tooling environment and offers little in information management compared with other ETL vendors. iWay Software is most widely known and adopted by organizations that have standardized on Information Builder's WebFOCUS business intelligence solution. See the May 2, 2007, "iWay Software Is A Strong Performer In Enterprise ETL With Broad Connectivity" report and see the May 2, 2007, "The Forrester Wave™: Enterprise ETL, Q2 2007" report.

11 "Multidimensional OLAP (MOLAP) storage [pre-aggregates data and] provides the best query response, but with a penalty of some data latency. Real-time relational OLAP (ROLAP) storage lets users immediately browse the most recent changes in a data source, but at the penalty of significantly poorer performance than multidimensional OLAP (MOLAP) storage because of the absence of precalculated summaries of data and because relational storage is not optimized for OLAP-style queries." SQL Server Analysis Services offers the proactive caching options that can provide a balance between the enhanced performance of MOLAP storage and the immediacy of ROLAP storage and provide automatic refreshes when underlying data changes or on a set schedule. Source: http://msdn.microsoft.com/en-us/library/ms174769(SQL.100).aspx

12 Microsoft has made a number of acquisitions recently that indicate that it is well on its way to offering a more complete BI stack. Since June 2007, Microsoft has announced its intention to acquire Stratature for master data management, Zoomix for data quality, and DATAllegro for data warehousing appliances. Sources: "Microsoft Acquires Stratature," Stratature press release, June 7, 2007 (http://www.stratature. com/merger.html); "Microsoft Signs Agreement to Purchase Data Quality Start-up Zoomix," Zoomix press

release, July 14, 2008 (http://www.zoomix.com/pressreleases_article.asp?id=26); and "Microsoft to Acquire DATAllegro," DATAllegro press release, July 24, 2008 (http://www.datallegro.com/pr/7_24_08_microsoft_acquisition.asp).

[13] "BIRT is an Eclipse-based open source reporting system for web applications, especially those based on Java and J2EE. BIRT has two main components: a report designer based on Eclipse, and a runtime component that you can add to your app server. BIRT also offers a charting engine that lets you add charts to your own application." Source: "BIRT Overview" (http://www.eclipse.org/birt/phoenix/intro/).

[14] Most visionary business process management (BPM) vendors — like Appian, Global 360, Lombardi Software, Savvion, and TIBCO — now find that they've been defining their own market too narrowly. Not only do enterprises need to optimize their business processes, they also want to optimize their business results. As TIBCO recently demonstrated by buying Spotfire — a small but visionary business intelligence vendor — the next strategic move for organizations seeking business optimization will be to combine BI and BPM for visualizing process metrics and business results together and, even more importantly, to turn transactions into decisions. If BI vendors don't put higher emphasis on this very real business optimization trend soon, they'll be outflanked by BPM vendors that are busy reinventing BI and moving aggressively into the emerging business optimization market. See the September 19, 2007, "From BPM To Business Optimization" report.

[15] Dashboards are increasingly popular as a favorite management tool to measure and analyze past and present performance and potentially discover trends that provide insight into the future. However, dashboards are just the tip of the iceberg of business intelligence, which is a set of methodologies, processes, architectures, and technologies that transform raw data into meaningful and useful information. Source: October 10, 2007, "Dashboards — Turning Information Into Decisions" teleconference (http://www.forrester.com/rb/teleconference/dashboards_%26mdash%3B_turning_information_into_decisions/q/id/2037/t/1).

[16] "TIBCO Software today [June 19, 2008] announced that it has entered into a definitive agreement to acquire Insightful Corporation, a provider of statistical data analysis and data mining solutions, in a transaction valued at approximately $25 million. Insightful technologies are expected to complement key growth areas within TIBCO's business optimization portfolio, including TIBCO Spotfire's Enterprise Analytic Platform." Source: "TIBCO Announces Agreement to Acquire Insightful Corporation," TIBCO press release, June 19, 2008 (http://www.tibco.com/company/news/releases/2008/press913.jsp)

[17] "Panorama Software has partnered with Google to provide new capabilities to Google applications and Google Docs via [a] suite of analytics, reporting and visualization applications. Panorama's solution provides ready to use functionality with solutions such as 'Panorama Pivot Tables for Google Spreadsheet' but is also designed to enable Independent Software Vendors (ISVs) to take the power of [its] platform and develop customized analytical hosted applications that integrate with Google applications." Source: "Panorama Software Powers Google Apps" (http://www.panorama.com/google/)

On October 29, 1996, Microsoft "announced its acquisition of multidimensional Online Analytical Processing (OLAP) technology from Panorama Software Systems of Tel Aviv, Israel. Panorama's [. . .]

technology is based on a three-tier multidimensional architecture designed to support online analytical processing, enterprise information systems, and decision support applications." Source: "Microsoft Announces Acquisition Of Panorama Online Analytical Processing (OLAP) Technology," Microsoft press release, October 29, 1996 (http://www.microsoft.com/presspass/press/1996/oct96/pan2pr.mspx)

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