Evaluating Business Intelligence Offerings:

Business Objects and Microsoft

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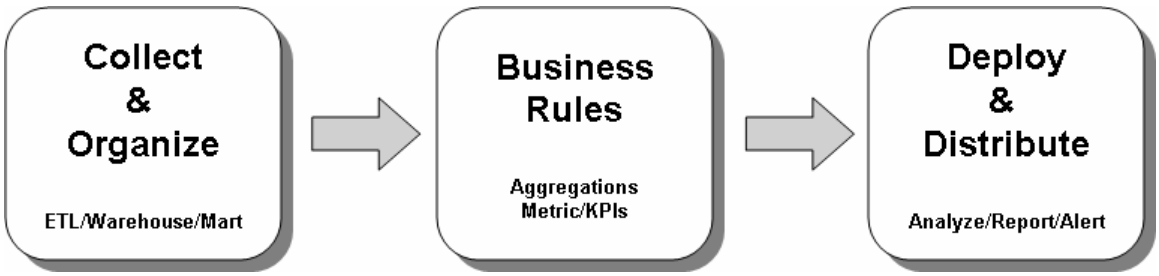
Introduction

Choosing a Business Intelligence ("BI") offering is an important decision for an enterprise, one that will have a significant impact throughout the enterprise. The choice of a BI offering will affect people up and down the chain of command (senior management, analysts, and line managers) and across functional areas (sales, finance, and operations). It will affect business users, application developers, and IT professionals. Before deciding on a BI offering, business decision makers must evaluate a company's BI offering with respect to what it has to offer each of these stakeholders. This paper will analyze the key considerations for deciding on a BI offering, review the BI strategies of Microsoft and Business Objects, and then evaluate each company's offerings in light of these key considerations.

What is Business Intelligence

BI is a broad topic, covering many different functions (e.g., reporting and analysis) and technologies (e.g., data warehouse, OLAP, portal). An examination of the literature shows many varying definitions of BI. These definitions fall into two classes: a technical description of the components that make up a BI solution and an explanation of the business purpose of BI. A good definition of BI that encompasses both technical functionality and business purpose is the following: BI is a broad category of applications and technologies for gathering, storing, analyzing, and providing access to data to help enterprise users make better business decisions. To effectively evaluate the offerings of BI vendors, how well an offering satisfies both sides of the equation must be examined.

BI applications include the activities of decision support systems (DSS), query and reporting, online analytical processing (OLAP), statistical analysis, forecasting, and data mining. Another way of phrasing this is that BI applications take data that is generated by the operations of an enterprise and translate that data into relevant and useful information for consumption by people throughout the enterprise.



To deploy BI successfully throughout an enterprise requires a platform, not a hodgepodge of tools and technologies. As such a BI platform must be able to address all the BI needs of an enterprise. Gone are the days where BI was a point solution used by a limited set of highly trained analysts. In today's market, BI is pervasive throughout an enterprise and in many cases mission critical. As such, a BI platform must be able to address both the breadth and depth of the needs of an enterprise.

Key Considerations in Deciding on a BI Offering

Business decision makers must evaluate both the breadth and depth of a BI offering in order to make an appropriate decision on a BI offering. The breadth of a BI offering is a measure of how well the BI offering supports the different requirements of the BI stakeholders. The depth of a BI offering is a measure of its vertical integration, i.e., how well the BI offering enables a business to take raw data from a production system and transform it into relevant and useful information and then deliver this information to business users in the proper context.

There are many steps required to generate consumable BI from raw data and there are various BI stakeholders within an enterprise that have a vested interest in the process. IT professionals, application developers, and business users (who are also the consumers of BI) all play a role in the development of a BI solution. Business users define the business rules that determine how the raw data must be transformed. Application developers develop the processes for acquiring, consolidating, and presenting the raw data based on the business rules. IT professionals manage the processes, ensure availability, and enforce security.

Requirements of Business Users

Different types of business users have different requirements of a BI offering.

- Analysts – Analysts support managers with performance management analysis. Analysts require a powerful and interactive environment that allows them to create metrics and navigate the data in an ad-hoc setting. This type of user requires tools for analytics, statistics, predictive modeling, and advanced visualization.
- Managers – Managers at all levels need BI to assist them in making informed business decisions. This type of business user requires a friendly query environment that also supports the ability to generate ad hoc reports and delivery mechanisms that enable managers to disseminate information up and down the chain of command.
- Operations workers – Operations workers use BI as part of solving a larger issue. For example, as part of servicing a customer, a retail clerk might recommend other related products to a customer. This type of worker requires BI that is embedded in a production application, rather consuming BI as part of a BI application.

Business users of all types want to reduce their dependence on IT, but still have confidence in the numbers, have advanced analytics, superior query performance, and access to timely information in the format and delivery mechanism of their choice, whether through a portal, a spreadsheet, or email. Satisfaction of these business user requirements enables BI to truly become mission critical, fulfilling the promise of BI, and providing businesses with competitive advantage in the global marketplace.

Requirements of Application Developers

Application developers must be able to develop the variety of BI application types required by business users that are essential to enable enterprises to obtain competitive advantage in the global marketplace. The range of capabilities that a BI offering needs to support is as varied as the BI applications required by enterprise business users. BI applications such as sales analysis need to be able to handle large data sets (terabyte) with very long lists of dimension members (in the millions). Other BI applications must support complex calculations for the derivation of key performance indicators or financial reporting modeling. Other BI applications merge BI analytics with data collection for budgeting, planning, and forecasting. Still other BI applications require very low data latencies for use in business activity monitoring applications to create real time BI. The BI applications developer requires a BI offering that is capable of supporting this entire range of BI applications.

In an enterprise today, BI is frequently embedded in business processes that support operations workers and needs to be seamlessly integrated into existing applications, and then easily extended as new BI needs are discovered. Application developers must be able to use existing

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skill sets, reuse code and components, and leverage existing applications and infrastructure to be able to meet the increasing need for BI that can be easily maintained and extended without requiring new skill sets. A crucial factor for the productivity of application developers is having a single development environment that allows them to work on all aspects of BI, from the data to the analytics to the user interface using a single development language, and that supports team development.

Further, application developers must be able to easily extend BI applications using third party tools and technologies where necessary. These third party products must integrate existing BI applications, rather than operate parallel to the platform. This requirement is an acceptance of the fact that there is no perfect product in the market. A BI offering might fulfill most of an enterprise's needs, but there are always a few cases where requirements cannot be met with the existing offering. Extensibility offers a safety valve in such cases.

Requirements of IT Professionals

IT professionals require a BI offering that enables them to deliver mission critical BI; namely a BI solution that is highly available, reliable, and secure. IT professionals require a back-end solution that is fault-tolerant and scalable; that supports change control and scriptable deployment; and that enables them to leverage their existing resources and skill sets while building on the current IT platform and infrastructure. Furthermore, IT professionals must be able to deliver real time or near real time data to business users with minimal degradation in query performance.

Summary of Key Considerations

The scope of BI uses is large enough that trying to meet all of the needs discussed above with a portfolio of stand-alone tools is inefficient, costly, and ultimately ineffective. Yet in order to provide leverage, the BI offering must have a consistent manner of accomplishing tasks while integrating with the existing infrastructure. This consistency will result in reduced training cost for business users, application developers, and IT professionals; shorten development time for new applications and enhancements; and result in greater acceptance by business users.

In summary a BI offering must:

- ⇒ Support the end-to-end building of a BI application, from data source to the presentation of information
- ⇒ Encompass the diverse business user needs of analysts, managers and operations workers
- ⇒ Provide a solution for the varied application areas such as finance, sales, and production.
- ⇒ Address the needs of various BI stakeholders in the enterprise: business users, application developers, and IT professionals.

Comparing the BI Strategies of Business Objects and Microsoft

Business Objects and Microsoft have very different strategies for approaching the BI market, which has resulted in very different BI offerings.

Business Objects started with a client tool for business users in 1990 and then pursued a backwards integration strategy to provide a more complete BI platform for the IT professional and application developer arena with its BI Application Foundation for analytical application development. The strategy of Business Objects has been a strategy of acquisitions to evolve into a broader back-end platform while still maintaining its focus on its original end-user audience.

Microsoft entered the BI market in 1997 with a high-performance analytical server offering and pursued a forward integration strategy to provide a more complete BI platform based on an open architecture supporting both Microsoft and third-party developer and end-user tools compatible

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with its analytical server offering. Because Microsoft chose to enter the BI market 7 years after Business Objects, the initial technology base for the Microsoft product reflects a more modern architecture. The Microsoft BI architecture also reflects Microsoft's strategic focus on a wide audience of IT professionals, application developers, and business users.

A Historical Overview of the BI Offerings of Business Objects

Business Objects' entry into the BI marketplace in 1990 was a client tool that displayed data from relational databases in tables and graphs before such functionality was considered BI. Business Objects differentiated itself in the marketplace by providing a semantic layer (called a "Universe") that insulated the business user from the physical database structure details. A Universe is basically a way to rename columns to more appropriate business terms, create new calculated columns, and hide the complexity of table joins.

In 1997, to meet the growing need of web based deployments, Business Objects introduced Web Intelligence, a browser-based query tool. While the initial functionality of this tool was limited, Web Intelligence is now the premier query tool within the Business Objects product line.

As the concept of BI took hold in the market, Universes were enhanced to represent dimensions with hierarchies and measures. Also, the client side was enhanced to provide better BI-style analysis, such as top x queries.

As Business Objects recognized the growth in OLAP multidimensional databases, Business Objects purchased OLAP@Work to obtain both an Excel-based query tool and a vehicle for access to Microsoft's Analysis Services. OLAP@Work became the basis for BusinessQuery.

In 2001, Business Objects released Application Foundation, an analytical application framework for jumpstarting analytical applications. Its Dashboard was initially part of the Application Foundation and has since been split out as a separate offering. The Application Foundation contains three analytical engines:

- Set analysis for segmentation of various business perspectives such as customer or suppliers
- Predictive analysis for time series forecasting
- Statistical process control for Six Sigma and Total Quality Management.

Despite its name, the Application Foundation provides features more oriented to end-users than IT professionals and application developers, which is a reflection of Business Objects' traditional orientation toward the end-user.

Next, Business Objects acquired Acta, a data integration vendor for Data Integrator, its extraction, transformation, and loading (ETL) product. Data Integrator has failed to gain market traction and has languished since its acquisition by Business Objects. In 2003, Business Objects acquired Crystal Decisions, which gave Business Objects a managed reporting solution with Crystal Enterprise and Crystal Reports, and an OLAP query and analysis tool in Crystal Analysis (which is now known as OLAP Intelligence).

Business Objects has filled out its product line mostly through an acquisition strategy. While this strategy has allowed Business Objects to rapidly expand its product line, this rapid expansion strategy has come at a price. Business Objects has experienced difficulties in integrating companies located in diverse geographical areas with different business structures and cultures, and has not always been successful in this integration, as in the case of Acta. The acquisition of diverse products has also provided distinct integration challenges. The most recent release Business Object XI has repackaged the entire Business Objects suite of products. Before Business Object XI, the Crystal and Business Objects product lines were separate and distinct. With this recent release, Business Objects has brought common administration to the product

line, though the tools themselves remain discrete. Furthermore, Web Intelligence and Crystal Reports still have different file formats.

A Historical Overview of the BI Offerings of Microsoft

Microsoft entered the BI marketplace in 1997 with the release of SQL Server 7. There were two aspects to Microsoft's initial foray into BI. The first aspect was OLAP Services, which was based on technology that Microsoft acquired from Panorama Software. The second aspect was Data Transformation Services (DTS), a data integration tool. OLAP Services was well-received because it lowered the cost of entry for analytics and raised the bar for performance and scalability in a multidimensional database. Microsoft's decision to enter the BI market with a database rather than an end-user BI tool has provided a strong base from which to integrate end-user products while offering performance capabilities unattainable in competing end-user BI tools that relied on third-party, back-end server technology for performance.

In conjunction with its release of OLAP Services, Microsoft released the OLEDB for OLAP specification that became a de facto multidimensional database access standard even before the SQL Server 7 shipped. This standard evolved into the XML for Analysis (XML/A) standard, which has been adopted by a wide variety of server and client tool vendors. There are now many client and server products in the market that have adopted XML/A, which provides a robust platform with a variety of choices for developers and end-users alike.

In 2000, Microsoft released SQL Server 2000. In this release, OLAP Services was renamed Analysis Services. Its feature set was broadened, scalability was increased and data mining capabilities were added to make Analysis Services ready for enterprise deployment.

In 2002, Microsoft released SQL Server Accelerator for BI (SSABI), a rapid application development tool for the Microsoft technology stack. Unlike other rapid application development products on the market at the time, SSABI generated the relational and multidimensional schemas based on a metadata description rather than relying on a fixed schema tailored to an application.

In early 2004, Microsoft released Reporting Services, a managed reporting solution. Reporting Services is a component of SQL Server 2000 and completed Microsoft's BI server offerings. With Reporting Services, Microsoft introduced Report Definition Language (RDL), an XML grammar to describe the layout and query information of a report. Reporting Services broke with the tradition of monolithic reporting servers by separating report definition from report rendering. This architecture opened Reporting Services to third party enhancements and application development customization. Furthermore, Reporting Services reports can be automatically generated from business processes and report output can be integrated seamlessly into custom applications with a unique look and feel.

In 2005, Microsoft released SQL Server 2005, substantially re-architecting major components of its BI offering.

- Integration Services, which replaced DTS, provides a better paradigm for managing ETL and brings greater scalability.
- Analysis Services has a new data model (the Unified Data Model or "UDM") that allows for a more realistic business view of data with an improved approach to creating calculations and managing key performance indicators ("KPIs"). Analysis Services also adds support for real time or near real time querying without a dramatic degradation in query performance.
- Reporting Services adds Report Builder, an ad-hoc report creation and modification tool, and a graphical MDX query builder. These features give developers and power users the capability to generate reports without knowing SQL or MDX.

In SQL Server 2005, the development and management tools are based on Visual Studio 2005, which gives the product line a greater integration with .NET, provides support for team development, enhances debugging capabilities, and improves productivity by leveraging existing skill sets among application developers and IT professionals. Further evidence of the integration with Visual Studio 2005 is the introduction of reporting controls that can be embedded within applications to easily embed SQL Server Reporting Services into applications.

Microsoft's BI strategy of starting with the back-end analytical engine and moving forward to support end-users has resulted in a broad BI offering that is architected to support a myriad of both Microsoft and third-party developer and end-user tools.

An Evaluation of the BI Offering of Business Objects

At its core, Business Objects is a set of independent reporting, query, and analysis tools tied together in a portal with a common environment for managing access and distribution. While each of these tools does its job well, each is a separate tool servicing different user communities with very little integration between the tools. The design environment for each tool is very different, which reflects the differences in their evolution.

With the release of Business Object XI, Business Objects has made strides to unify its product line. Building on Crystal Enterprise, Business Objects Enterprise forms the basis for its BI offering, providing management and deployment of the reporting, query, and analysis tools. InfoView is the portal that coordinates the access to documents from the tools. The core of the tool set is Crystal Reports, Web Intelligence, and OLAP Intelligence. The Designer creates Universes that are semantic layers that hide the complexity of SQL from users building queries.

The unifying factor in the Business Objects product line is the Universe. A Universe acts as a layer between the data source and the query. Universes can be used with Crystal Reports and Web Intelligence. However, a Universe is not applicable to OLAP Intelligence because an OLAP data source has its own business metadata. When the Universe was first introduced, it was an innovative concept and assisted non-technical users in creating relational queries. Universes have not kept up with the needs of the market and add little to a BI infrastructure.

Business Objects does not provide client tools to manage the BI infrastructure and does not address the back-end data needs of BI, such as:

- Aggregate management, which is an important aspect of a BI system given the current data volumes.
- Real time BI, which is growing in importance and requires a different approach to data acquisition than data warehouses or marts.
- Tools that assist an enterprise to manage its BI data, other than Acta (which is not widely used).

Though there are application program interfaces (APIs) for most aspects of the Business Objects' product line, these APIs do not really provide the type of tight integration required by enterprises today. The only thing that has been integrated is a collection of reports and queries. A Business Objects table, grid, or graph has a specific Business Objects look and feel that is usually different than the user interface design of the rest of a BI application. This is not truly embedding BI within an application, but rather it is wrapping a set of tools together within a BI application.

While Business Objects puts itself forward as a complete BI offering, its product line does not cover the breadth and depth that a BI offering requires to meet the diverse needs of its BI stakeholders. Client tools united together do not constitute a BI platform. Business Objects' client tools are targeted at executives and managers for performance management. Serving this community is just an element of full BI platform. Client tools are just one piece of the software

stack required to create and manage a BI infrastructure. Without a mechanism to manage and understand the back-end data, vertical integration of the BI stack is missing. This gap creates a potential disconnect between the back-end and the front-end that lengthens development time and can create problems.

Probably most limiting about Business Objects' approach to BI is that its BI offering results in a closed BI solution. Once an enterprise commits to Business Objects, the enterprise has severely limited its extensibility options and there is little leverage of the existing infrastructure and skill sets. Business Objects does not support a vigorous third party software market of tools that fills in the gaps in its BI offering. Business Objects has not been adopted by application vendors as a BI application deployment tool. The investment in Universes can only be used by Business Objects tools: there is no leverage in using Business Objects, other than within its own tools.

An Evaluation of the BI Offering of Microsoft

Unlike Business Objects, Microsoft builds its BI offering from the analytical server up. This provides a solid foundation for the many different BI roles within an enterprise. Building from the data management up to the client tools gives an enterprise the ability to centrally manage BI and leverage its use throughout the enterprise.

With the release of SQL Server 2005, Microsoft has created a backbone of BI server components. In addition to its flagship relational database engine, Microsoft has the full complement of required BI elements. Integration Services manages the flow of data in or out of a BI system and across components of the BI system. Analysis Services provides analysis, metrics, and key performance indicators, as well as real time analytics. Reporting Services provides managed and ad hoc report authoring and delivery.

Microsoft has a unified and integrated view of metadata. Data source views describe the schema of the source data. Report Builder puts the schema in context and allows power users to easily navigation through the information and build ad hoc reports. The Unified Dimensional Model adds the business perspective and supports metrics and key performance indicators. Any tool or application can take advantage of the metadata to provide the relevant view of the information to appropriate users.

The strong integration of SQL Server with Visual Studio gives the application developer a unified environment for creating and maintaining BI applications. Sharepoint Portal Server provides a comprehensive portal environment for BI within an enterprise. This is not just a BI portal, but a single point of access for all information within an enterprise. Microsoft Office is also crucial. Excel is the most popular BI client tool. With pivot tables and Excel Add-In for Analysis Services, Excel becomes an integral part of a BI application. Office 12 will only add to this integration when it is released.

The large array of partners that have aligned with Microsoft BI reveals the strength of its platform. The use of open standards such as OLEDB, XML/A, and RDL gives the partner community a rich set of capabilities that allow them to extend the platform easily. These partners provide:

- Analytical tools – such as ProClarity and Panorama
- Query tools – such as Business Objects and Cognos
- Excel add-ins – such as IntelligentApps and XLCubed
- Analytical applications - such as OutlookSoft and GEAC
- Programming components – such as eBlocks and ChartFX.

In addition to the foregoing, there are many features within the Microsoft platform that provide support for moving BI into new uses. Proactive caching gives system support for real time BI. By building support for real time BI right into the engine, Microsoft allows real time BI applications to

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be built more easily and with greater reliability. The integration of SQL Server and the .NET framework with Visual Studio 2005 allows embedded BI applications to leverage the skill set and knowledge of the application developer without the worry of compatibility issues.

Summary

Business Objects provides a disparate collection of client tools with limited tool integration, little vertical integration, and without support for open standards that discourages the leveraging of the existing infrastructure and does not leverage existing developer skill sets. Microsoft provides an integrated collection of server and client tools, full vertical integration, and full support for open standards that leverages existing infrastructure and developer skill sets.

About Symmetry Corporation

Symmetry Corporation is a recognized expert in the design, development and implementation of advanced business intelligence solutions for Fortune 1000 companies and software vendors. BI is our sole focus and has been for nearly 20 years. A Microsoft Certified Gold Partner for BI, Symmetry is a longstanding member of the Microsoft BI Partner Advisory Council and a key contributor to the SQL Server Accelerator for BI (SSABI). Symmetry also created ADAPT, the first database design methodology developed specifically for multidimensional database applications, based on sound OLAP design principles. For more information, visit Symmetry's web site at http://www.symcorp.com or call (415) 453-7966.