



2008: A BI Odyssey

The Business Intelligence Crystal Ball

Business Intelligence (BI) has come a very long way in recent years. From back room reporting, in which every request for data started as a "Report Request" that was routed from business users to IT management, down to the programmers and back again, BI has now evolved into today's robust, highly intuitive tools that provide true business insights. Today's BI solutions provide interactive dashboards, complete with charting, graphing and other analytic tools. They include both ad-hoc and highly sophisticated reporting capabilities, allowing users to customize answers to their needs. They can notify users of critical changes in Key Performance Indicators (KPIs) via pagers, cell phones or other mobile devices. They provide features that meet the operational reporting needs of business users, while also accomodating more complex analytic insights and even foresights. With many of these features coming through the evolution of yesterday's BI solutions, more exciting is the promise of tomorrow's BI landscape.

Tomorrow's BI solutions are evident in Oracle's integrated Enterprise Performance Management (EPM) solutions. Combining their solid BI and Financial Performance Management tools into a coherent solution, the Oracle Business Intelligence Enterprise Edition Plus (OBIEE Plus) platform provides the solid foundation necessary for the future of BI. And with the addition of the BI Applications (aka Packaged Analytics), Oracle now offers the most comprehensive answer to tomorrow's BI Odyssey.

Oracle's BI Applications are a pre-built set of BI solutions, carefully crafted to meet the demanding business needs of its vast and varied customer base. With solutions geared toward specific functional business areas and also customized per vertical industry needs, Oracle offers a set of BI Applications that truly can be used "out-of-the-box". These applications do for BI what pre-built applications did for ERP. Remember the days of writing custom-coded Order Entry systems? We may soon be asking ourselves the same question, "Remember the days of creating custom-built BI solutions?"

This document highlights the evolution of Oracle's BI solutions, from their integrated EPM environment to the OBIEE framework and all they way to their revolutionary BI Applications.

Oracle's Integrated EPM Solution

Integrating the recent additions to their BI tool-set, Oracle has recently announced the formation of their Enterprise Performance Management team, which combines their Financial Performance Management and Operational BI groups into a unified team. With their track record for integrating acquired technologies, Oracle's linkage of these groups will only strenghten the consolidation of its vast BI stack into single, coherent solution. Their vision is a world of

integrated Financial Performance Management and Operational BI Systems as noted below, both feeding from an organization's Transactional Systems.



Figure 1: Oracle's EPM Vision

Financial Performance Management solutions from Oracle are a result of their acquisition of industry leading, Hyperion tools, including:

- Financial Modeling
- Planning and Budgeting
- Financial Management
- Financial and Statutory Reporting
- Metrics and Scorecards

Operational BI Systems include the remainder of Oracle's BI solutions, including:

- Data Warehouse
- Data Integration
- Query & Analysis
- OLAP
- Dashboards
- Operational Reporting
- Alerts & Workflows
- Office tools Integration

Transaction Systems supported by Oracle's integrated EPM solution include the entire range of Oracle tools, from e-Business Suite, to PeopleSoft, to JDEdwards, to Siebel. In the spirit of Oracle's "Hot-Pluggable" mantra, other vendor's transactional solutions are also supported, such as SAP.

OBIEE Plus Framework

Oracle Business Intelligence Enterprise Edition Plus (OBIEE Plus, also referred to in this paper as simply OBIEE) is Oracle's best and most complete solution for delivering enterprise wide Business Intelligence. Combining the flexibility and ease of use inherent in today's web-based solutions, BI solutions deployed using OBIEE meet management's needs of providing high-level information at a single "click" and analyst's needs for robust ad hoc and structured analysis. Backed by a detailed array of charting, graphing, alerting and reporting facilities, OBIEE supports all of your organization's reporting needs. Whether your users are regularly sitting in front of an

Internet-ready workstation, have only periodic access to email, or are out in the field equipped solely with a cell phone, OBIEE enables communication of critical changes in KPIs to all levels of your organization.

The first requirement when deploying BI enterprise-wide, is that the technology behind your BI solution be rock solid. It must provide a level of scalability and flexibility that allows you to adopt and adapt it to your broadest needs. When new requirements or entire new groups of users are brought on-board, your BI solution should allow you to adjust to these in-fluxes simply by modifying your configuration and/or expanding your environment. Changes in KPIs or other reporting needs must be simple to incorporate into your existing reports, dashboards, alerts and other analytical tools. Even events as disruptive as mergers and acquisitions, which often bring with them an entire new realm of databases from various vendors, must be accounted for in your BI environment.

Oracle's Business Intelligence Enterprise Edition meets those demands of today's highly flexible, agile organizations.

A multi-faceted technology stack, OBIEE consists of the following components:

- Oracle BI Server – the engine behind OBIEE
- Oracle Interactive Dashboards – providing web-enabled analytics
- Oracle Answers – modify your analytics interfaces without programming
- Oracle Reporting and Publishing – develop printer and form quality reporting
- Oracle Delivers – notify users of significant changes to critical KPIs
- Oracle Disconnected Analytics – lets occasionally connected users analyze data
- MS-Office Plug-in – provides users data, charts and graphs in familiar office tools
- Web Services – integrates business processes into analytic solutions

These components are depicted in the architecture diagram shown in Figure 2.

This paper will describe each of these products in detail, describing their functionality and utility in your enterprise-wide BI initiatives. Examples will also be provided of the various components in action. The administration and modeling components of OBIEE will also be explored, showing the three layers of data models (Physical, Semantic Business, Presentation) and describing the usefulness of each. Finally, tips, tricks and techniques will be provided to guide you in your development and deployment of solutions using Oracle Business Intelligence Enterprise Edition, along with some glimpses of future additions to the OBIEE product suite.

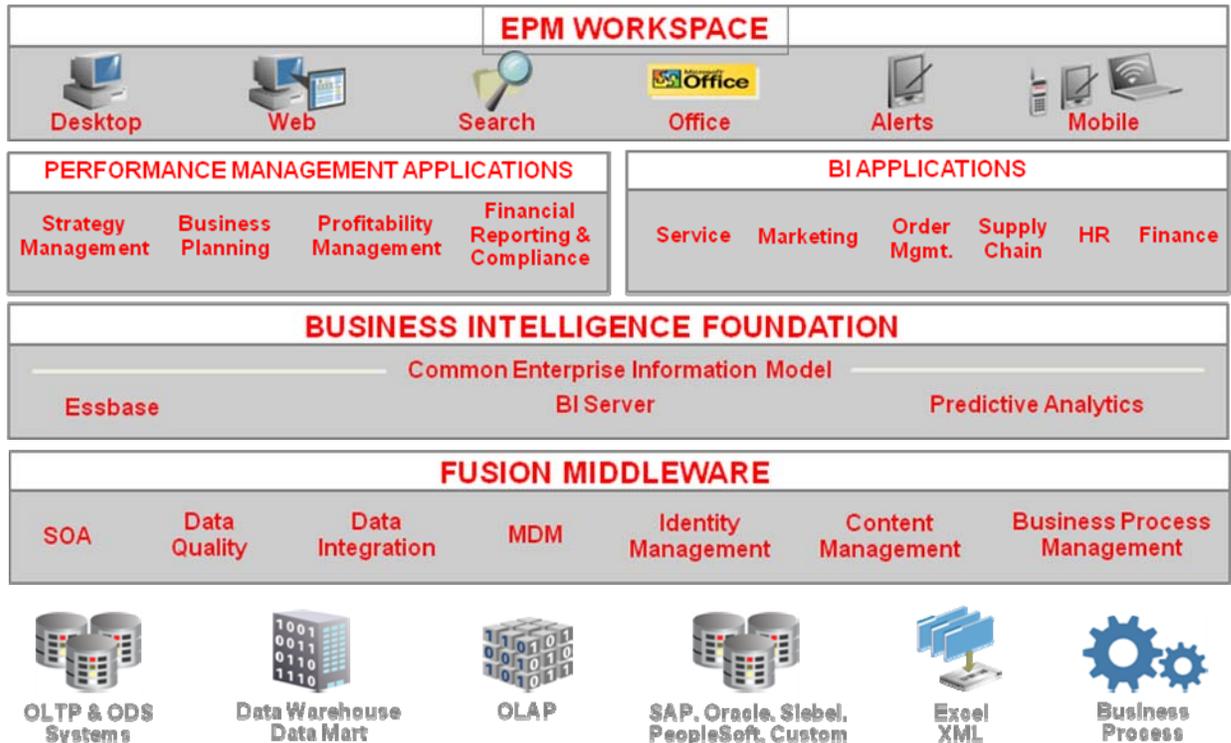


Figure 2: Oracle Business Intelligence Enterprise Edition Architecture

Oracle BI Server

The Oracle BI Server is the engine at the core of the OBIEE solution. Built on the premise of providing open, standardized interfaces, the BI Server's query abstraction services allow users to access one or more heterogeneous data sources without knowing the full details of the underlying data structures. Supporting a multitude of different data sources, OBIEE allows for integration of relational databases, formatted files, XML files and even multi-dimensional data sources. The BI Server maximizes query response speed through intelligent request generation and optimized data access services. In addition, it adds intelligent caching services to further maximize performance throughput.

Utilizing the Enterprise Business Model and Abstraction Layer, the Physical data structure is separated from the Presentation layer as depicted in Figure 3. This separation is how OBIEE accesses a number of different data structures, without impacting the resulting user interaction. Users are insulated from that level as they interact solely with data in its Presentation Layer format. In addition, OBIEE includes a Semantic Business layer, which allows for more complex operations to be performed in either the Physical or Business layer, whichever would be more optimal for the complexities of your query and the nuances of your environment.

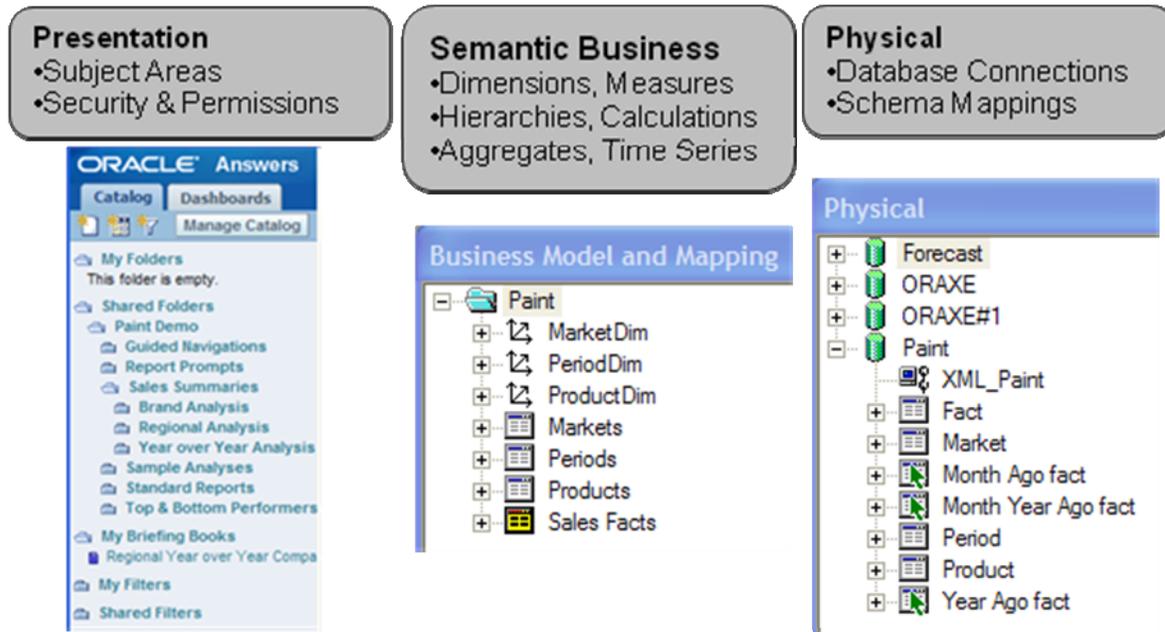


Figure 3: OBIEE Data Model Layers

Data sources supported by the Oracle BI Server include normalized relational databases such as OLTP and ODS systems, dimensional modeled Data Warehouses and Data Marts, OLAP data sources such as Oracle OLAP, Essbase and even competitors OLAP solutions, application databases such as SAP, Oracle eBusiness Suite, PeopleSoft, and Siebel, Excel files, and XML files. OBIEE even supports non-Oracle databases such as SQL Server, DB2 and Teradata. It also provides access to external business processes through a Web Services interface. A complete list of the data source supported is noted below:

- *Relational Database Systems:* including Oracle7, Oracle8, Oracle 9i, Oracle 10GR1, Oracle 10GR2, Oracle 10G RAC, UDB DB2, OS390 DB2, AS400DB2, SQL Server,
- Teradata, Red Brick, Informix, Sybase, and Microsoft SQL-Server.
- *Various Host Data Sources* including VSAM, IDMS, IMS, and CICS.
- *Enterprise Applications* including Oracle, Peoplesoft Enterprise, JD Edwards Enterprise One, Oracle e-Business Suite, and SAP R/3 and mySAP.
- *OLAP Sources* including Oracle Database OLAP Services, Microsoft Analysis Services Cubes, Hyperion, and SAP BW Infocubes.
- *XML Data Sources* including access to other types of data servers (e.g., other nonrelational servers), Microsoft Excel spreadsheets, and Web Services.

The Oracle BI Server's query execution engine delivers intelligent request generation and optimized data access services. Parsing user queries into logical requests, data navigation paths, rewrites and then finally database access code, the BI Server provides a ground-breaking approach to compiling complex, heterogeneous queries.

Supporting full ANSI SQL92, the BI Server's knowledge of data navigation paths and query rewrite capabilities allow OBIEE to build complex, multi-platform, multi-database joins in an optimal fashion by using its complete knowledge of both the logical query request tree and the physical execution plan. With built-in support for common analytic approaches such as time

series comparisons, shares and dimension-specific aggregation rules, the BI Server's query request generation capabilities are optimized across a broad base of data access routes.

After utilizing the functionality contained in the logical layer of the BI server to develop the logical SQL statement, the BI Server then rewrites the query into optimal native SQL code. This optimization of data access code includes function shipping to form native SQL query strings, internal sort/merge or nested loop joins, aggregations and filters that are sent directly to the source database.

Finally, in its query execution step, the BI Server's parallel query capabilities allow multiple queries to be submitted and executed asynchronously on different machines if required. The BI server then works with the result sets from the independent queries by utilizing optimized sorts, rankings and filters that could only be applied once all the results had been combined from the independent sources.

The BI Server meets the performance, scalability and reliability needs of large user bases by relying on its enterprise strength architecture. Its highly efficient server design includes an array of features focused on optimal memory management, lock and latch contention elimination, parallel query execution and high-throughput connectivity adapters. In addition, BI Servers can easily be clustered together with session replication and automatic fail-over when performance demands exceed the capabilities of a single server. With connection pooling, query reuse and data caching, the Oracle BI Server pulls out all the stops to ensure optimal performance and minimize redundant use of computing cycles.

Scalability and reliability of the Oracle BI Server is further enhanced by its comprehensive server management capabilities. BI Server administrators are provided with tools to view and manage session and query executions, monitor cache usage details, and peruse detailed statistics logs. These data points enable administrators to proactively monitor and optimize the BI Server environment as usage patterns change or reactively diagnose any performance problems encountered.

Interactive Dashboards

OBIEE provides users with a rich, interactive web-based Dashboard interface. Through Dashboards, users can view and interact with a number of live reports, charts, tables, pivot tables, graphics, tickers and prompts as shown in Figure 4.

OBIEE's intuitive interface, allows users to easily view and interact with their most critical data in the most efficient way based on their current analytic needs. Simple point-and-click ability allows for drilling down to more detail, changing display types or modifying report prompt values to show different results. The following scenario shows one sample Dashboard and how it can be navigated to drive key business decisions.



Figure 4: Sample Oracle Interactive Dashboard

From the dashboard shown above in Figure 4, users can easily drill down to details such as the Regional view shown below in Figure 5. This view can be provided in a pop-up window or it can overlay the entire dashboard. A drillable analysis can also be directed to the same location on the existing dashboard. With a few simple clicks, dashboard requests can easily be changed to provide users with more interactive analytic tools. In Figure 6 below, note the “Select Display Type” option included on the Regional Revenue portion of the original dashboard from Figure 4.



Figure 5: Sample Drill-down

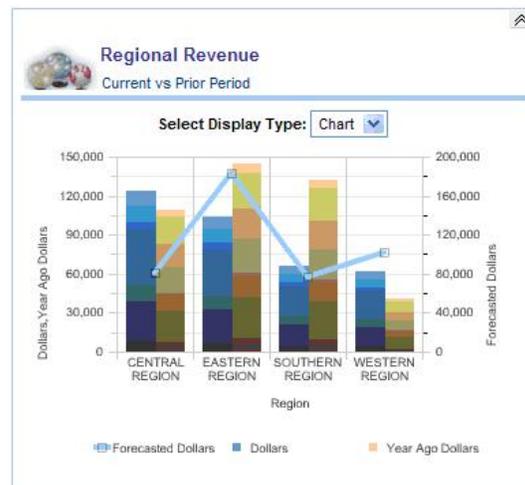


Figure 6: Flexible Output Type

Another powerful component of OBIEE Dashboards is its ability to drive business decisions, not just by providing a graphical, intuitive view of the data, but also by guiding the user down various analysis paths. This feature, Guided Analytics enables the content and layout of Dashboards to change dynamically based on changes in KPIs. For example, a dashboard for cost analysis might only show up when profits dip below given target. Guided Analytics also provides the ability to drive users down a certain analysis path by allowing the dynamic creation of links to various points of related content. For example, a rise in profit margin on a product by one region can result in a link to the analysis supporting this rise to all other regions, thereby enabling them to more quickly act on this knowledge and intelligently drive their actions.

The possibilities for Guided Analytics should not be discounted. This feature effectively allows a certain level of artificial intelligence to be embedded in your Business Intelligence applications, as business knowledge and acumen that was once part of a senior analyst or key decision maker's experience can now be mapped into your Dashboard. Providing different analytics or results in this event-based manner, nearly closes the loop on actual business decisions.

Oracle's Action Links takes this the final step, closing the loop from business analysis, to decision making, to action. Action Links provide the capability for Guided Analytics to drive directly from a BI dashboard into ERP applications. For example, an analysis of outstanding and overdue Accounts Receivable could provide a guided suggestion to place an extremely late customer on credit hold. Or, better yet, an Action Link could allow the user to jump directly from the dashboard to the "Credit Hold" function in an ERP system. This link from decision analysis to definitive action provides the true enablement that users have long awaited from their BI solutions. It provides truly *actionable information*.

Building these interactive Dashboards is almost as simple as navigating them. Without any programming or technical database knowledge, users can create their own Dashboard pages or modify existing Dashboards, adding more relevant content. The interface for modifying Dashboards is a basic layout editor that allows you to drag and drop pre-developed content from OBIEE's web catalog and place it in the desired location on your Dashboard, as depicted below in Figure 7.

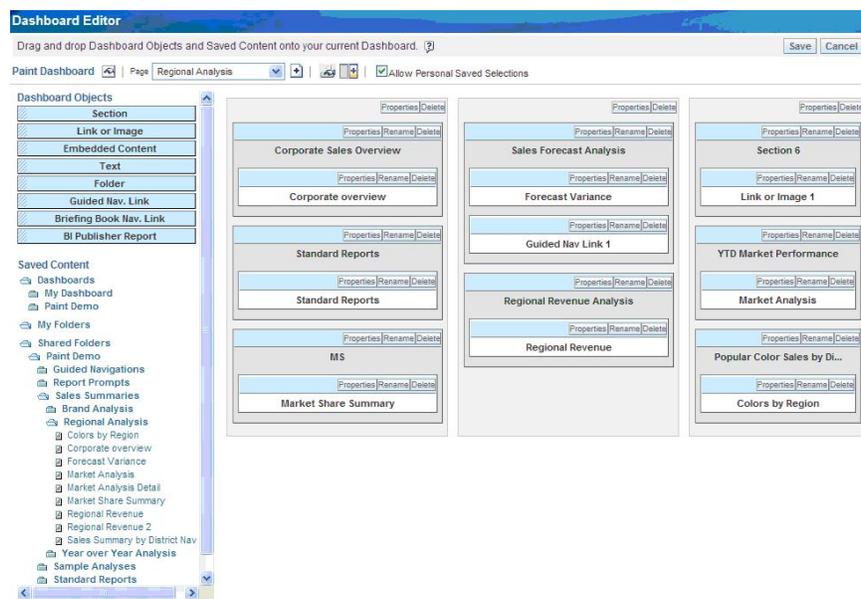


Figure 7: Oracle Dashboard Editor

OBIEE Dashboards provide further flexibility by allowing you to embed them in your corporate portal, place them into existing web pages, or embed them in typical office automation tools such as a Word document or Excel workbook.

Leveraging OBIEE's full security model, access to Dashboards can be constrained to limit users that can view various dashboards or components of dashboards. It can further limit the data that is shown in dashboards, providing unique users with a unique view of only the data to which they have access.

Answers

With a flexible and easy to use interface, OBIEE supports all range of users including the "one-click" executive or casual users, the more inquisitive users needing to drill-down to more details, and the analytical users that need the ability to drive their own investigative efforts. The Dashboards in OBIEE provide the intuitive and rich-featured user interface needed by all categories of users, while the Answers tool gives the more advanced users the ability to build their own data requests and create custom charts and graphs. A pure web-based environment, Answers, shown below in Figure 8, allows users to create new analyses of their own or modify existing analyses. Users can create all manner of interactive, drillable BI analyses, including charts, graphs, pivot tables, reports, gauges and dashboards. They can be saved, shared, modified, formatted or even embedded in your own Dashboard or Corporate Portal.

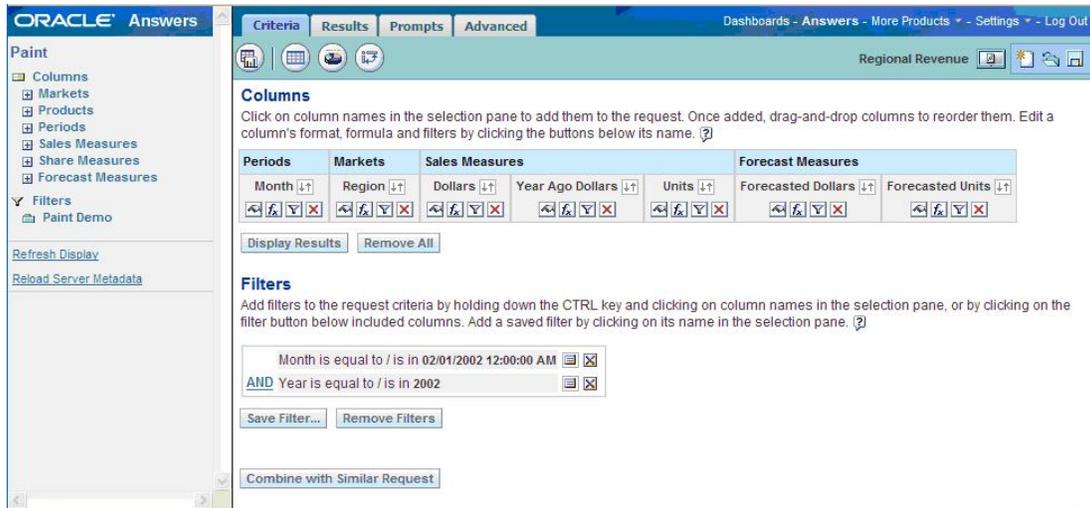


Figure 8: Oracle BI Answers – Selecting Columns

Working with the Presentation layer data model, users build Oracle Answers without any knowledge of underlying data structures nor the database technologies. In fact, through the capabilities of the BI Server, data can be stored on multiple independent servers in heterogeneous database platforms and queried by users with absolutely zero knowledge of database architectures, names or joins.

Users simply start the process of deriving answers to their questions by selecting a subject area, such as Marketing, Sales, or Inventory. They are then presented with a series of folders which

represent a set of semantic business objects. Those objects allow for users of Answers to view the database in business terms, grouped in a manner that makes business sense. Once a folder is selected, users then pick the measures of interest to them, and select dimensions that will be used to limit the resulting output.

The output of this exercise is called an “analysis”. Once an analysis is created, it can be saved for personal use or published across your enterprise. A saved Analysis can be modified later as future analysis needs or business requirements change.

Supporting the dynamic nature of an ad-hoc analysis effort, Answers does not prescribe a rigid order of operations. Instead, you can select measures, add filters, examine results, add new columns, change filters, delete columns, and more in whatever order is more intuitive to you or is best suited to your analysis efforts. Users can view their results in whatever visualization makes the most sense, including charts, graphs, pivot tables, tables and other formats.

Answers also supports filtering and personalizing information based on a user’s identity or role, allowing the resulting data or output format to be driven by your security needs.

Reporting and Publishing

Despite the abundance of features in OBIEE’s rich Dashboard interface, presentation quality reports are still heavily relied upon in most business settings. Whether it is to communicate key metrics across your organization, share vital information to partners, regulators or other outside organizations, or provide another means of ensuring communication of key business information, reporting and publishing is a key component of any BI solution. As such, OBIEE provides Oracle BI Publisher as its comprehensive report formatting, printing and distribution tool. Providing “pixel-perfect” quality reporting, BI Publisher is capable of producing a wide array of output formats, including pre-printed W2 forms, marketing brochures integrating custom data for each prospect, checks and other forms that require highly precise placement of data, and more. Some sample output formats are shown below in Figure 9.

BI Publisher provides the ability to easily publish its report output to a vast array of document formats, including Microsoft Word, Excel, RTF, PDF, XML, EDI, and others. Report output may be created in different formats for different users, ensuring that each user can view the information in their tool of choice. For instance, if your analysts like using Excel to view the data, giving them the ability to do more dynamic “what-if” analysis with the results, then publish to them using Excel. If your SOX compliance team wants PDF format for easy distribution of reports to internal groups or external trading partners, then provide them with PDF.

Delivering reports to all of your enterprise users can be a daunting task, as each group has its own requirements for report batching, bursting and delivery. Integrated with the Oracle BI Server’s Job Scheduling facilities, BI Publisher has an easy to use administrative interface for defining, scheduling, managing, monitoring and correcting reporting jobs. Advanced report bursting allows different reports to be sent en-mass to different groups within your organization, with data-driven rules defining filters that determine who sees which portions of a given report. For instance, an enterprise-wide report can be burst into Regional sections, with each Regional manager receiving only their Region’s portion of the entire report. Their version can even be formatted specifically for their Region. With a number of various delivery options, reports can be published to online folders via WebDAV, distributed via email attachments, printed on corporate print servers, placed on local files servers for access internally or published via ftp sites.



Figure 9: BI Publisher Output Samples

Building presentation quality reports can be a demanding ordeal with most reporting tools. Banded report writers often perform some of the layout options quite well, but fall short on others. Old-style report scripting languages can provide precision report layouts, but require labor intensive 3GL-style coding. Oracle BI Publisher solves these problems by allowing business users to design report layouts using familiar tools. Reports can be designed in Adobe Acrobat or Microsoft Office document formatting tools, with links to OBIEE data sources embedded directly in the document templates.

This capability of designing report layouts via tools that users have comfort using and working with greatly reduces the amount of time spent iterating on designs of a report. Too often developers and users have different ideas as to how the report should look. Items such as colors, fonts, and placement can all be described visually using Microsoft or Adobe products.

Fully integrated with the entire OBIEE suite, BI Publisher shares all the common facilities that make OBIEE a high performance, scalable, reliable solution for integrating data from multiple different databases into a consolidated result set. Sharing common metadata, security, calculation, caching and intelligent request generation makes integration of BI Publisher reports with your Oracle BI solutions a natural extension.

Delivers

Oracle's BI solution includes a number of mechanisms for proactively communicating changes in KPIs. Oracle Delivers provides the ability to monitor business conditions and alert users via multiple delivery channels, including email, dashboards and mobile devices. Users can view and act on these messages, enabling them to make critical decisions in "business-time", without being constantly tethered to their desktop computer.

With an intuitive interface for defining, publishing and subscribing to alerts and conditions (see Figure 10), users control the events and messages that they receive. Any user can define their own process, or "bot", which monitors user-defined conditions, notifying them when thresholds are met or exceeded. Users can even personalize the deliver mechanism to meet their needs at

various times of day. For example, a bot can be set to notify you via email during business hours, but via cellular phone off-hours.

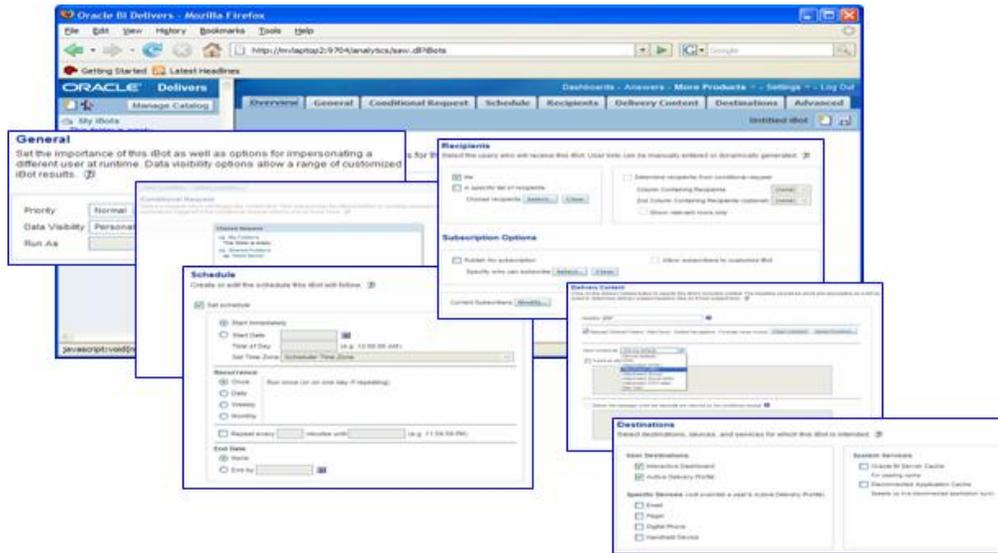


Figure 10: Configuring Delivers to Notify You

Ensuring that OBIEE supports your most demanding business conditions, Delivers handles the most complex scenarios. You can create bots that monitor complex conditions, including those that compare data from multiple sources, compare data on time-based conditions, and even monitor historical data.

Alerts from Oracle Delivers can trigger external business processes by interacting with the Oracle BPEL Process Manager. Talk about actionable information – this capability lets the information drive the action, even without user input. When linked with BPEL processes, OBIEE alerts have the capability to actually close the loop on business decisions in real-time. When a condition is met, a process can be started automatically, without the need for user intervention. For instance, if inventories fall below ordered quantities, an internal process can be activated that searches for alternate replacement parts and updates the pick list of all current orders on file with this information.

Briefing Books and Disconnected Analytics

To further ensure that Oracle BI solutions meet the needs of all the various use cases for BI in your organization, Briefing Books and Disconnect Analytics can be used to reach even more members of your team.

A Briefing Book captures the content of an OBIEE Interactive Dashboard and allows you to view it using client-side briefing book reader software. A snapshot of a Dashboard, the Briefing Book has the same look and feel as a dashboard page, allowing for viewing and interacting with your data. Intended as another tool for distributing dashboard content across your organization, Briefing Books can also serve the function of archiving your BI data, charts, and graphs.

Boardroom presentations can take advantage of the capabilities of OBIEE Interactive Dashboards without the requirement of being connected to your organization's network. Also, as the Briefing Book resides on a client machine, there is no worry about unexpected network, or database issues that may harm the flow of the presentation.

Oracle Disconnected Analytics rounds out the solutions for your extended user base. Users not regularly connected to the internal network can access Disconnected Analytics on their laptop, allowing them to peruse and analyze their data whether they are connected or not. Built on a sophisticated data and metadata synchronization platform, Disconnect Analytics moves data, metadata, dashboards, saved selections, filters and more to the mobile laptop. Supporting OBIEE's personalization and security mechanisms, all data is limited by role-based security and visibility constraints.

Office Plug-In

In a world in which data is often used in concert with office automation tools, no BI solution would be complete without enabling the use of these user-favorite, high-powered analytic tools. Data from any of your corporate sources can be incorporated in documents that are published with Microsoft Word, Excel and PowerPoint. Data may be embedded as a database schema itself, a measure, or a dashboard, with users controlling the layout and output format. The Office Plug-In preserves all the advanced functionality of the OBIEE environment, while providing another means for distributing shared content to facilitate collaborative decision making.

Web Services

Complete with a Simple Object Access Protocol (SOAP) API, OBIEE extends its ability to tightly integrate BI solutions into the entire range of your business activities. Oracle BI solutions can leverage the API to start and manage web sessions based on key business conditions. BI results can be embedded in dynamic web pages or any JSR-168/WSRP compliant Portal, such as Oracle Portal, allowing full integration of BI "answers" into your corporate knowledge sharing infrastructure. Oracle BI results can be retrieved from other applications in an XML format, extending BI's capability to be shared amongst disparate systems. Using SOAP, the BI Server extends your BI solutions so that they can be an integral component of more than just your analysis and decision making efforts – now BI can actually drive immediate action on your KPIs.

Oracle BI Administrator

Deploying dynamic BI solutions with OBIEE starts with the Oracle BI Administrator. A graphical administration tool, BI Administrator is used to map multiple physical data sources into a logical representation of their interrelated business content. On top of that logical layer, a presentation layer provides the ability to group and organize data into subject areas, folders and eventually columns that allow users to interact with measures, dimensions, functions, aggregates and more. These three layers are depicted in the example Oracle BI Administrator screenshot shown in Figure 11 below.

Separating the layers of metadata allows the Presentation layer to communicate to the business users in business terms and groupings. Columns and calculations can be named and organized as needed to provide the best possible experience for users in Answers. The Presentation layer will be in effect the "database" that users will know. Therefore the naming and grouping of

objects in the Presentation layer is extremely important. Time spent on that task can provide returns down the line in more efficient queries, higher usage rates and more Answers content being developed.

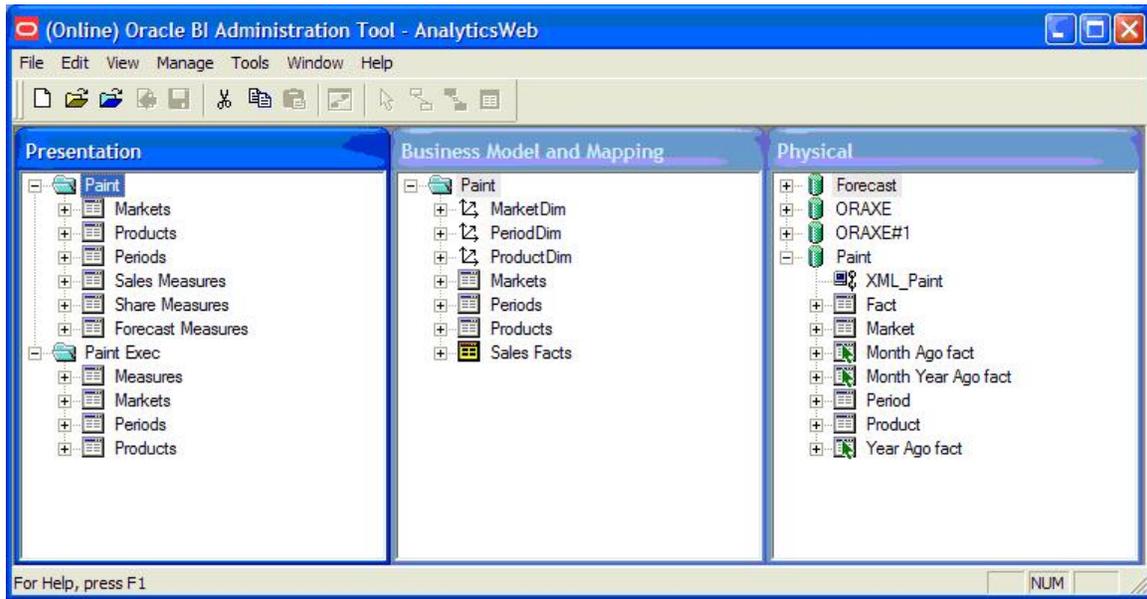


Figure 11: Oracle BI Administrator

The Oracle BI Administrator provides wizards that drive common modeling and mapping steps, simplifying the process of creating complex metadata definitions. It also includes metadata inspection tools that allow an administrator to determine interdependencies amongst database objects and logical business objects.

To support backup of metadata definitions and the migration of BI solutions from development to test and production environments, the administration tool provides export-import capabilities. This utility generates a complete definition of all presentation columns, business model details and physical data source mappings.

The BI Administrator also provides multi-user collaboration features, allowing users to work on models concurrently, checking out only the objects that they are editing and allowing other administrators to view these objects in read-only mode. Alternatively, if on-demand changes are essential, an administrator can choose to work in “online” mode, which locks the entire model while editing it, but does allow changes to be checked in without re-starting the server.

Finally, the Oracle BI Administrator includes the ability to monitor and manage the OBIEE environment. Administrators can view current user sessions, terminate sessions that are hogging resources, see variables used by sessions, list available cache details, report on cache usage history and more. This information is useful for diagnosing performance problems, understanding usage patterns, monitoring response times and managing overall system load.

BI Applications

As the final piece to their BI Odyssey, Oracle's BI Applications leverage the solid OBIEE Plus framework to provide a sophisticated series of BI solutions tailored to users specific needs. Oracle offers pre-built BI components geared toward a number of functional business areas, such as Financials, Human Resources, Supply Chain, Sales, Services and Contracts, Marketing, and Order Management and Fullfillment. Each of these functional BI solutions provides analytic features that monitor and track numerous KPIs associated with that area. For instance, the Financials BI Application provides KPIs focused on subjects areas such as Accounts Receivable, Accounts Payable, GL / Balance Sheet Analysis, Customer Profitability, Profit and Loss Analysis, Cash Flow Analysis and more. The center of Figure 12 depicts the BI Applications available and highlights the subject areas covered by each of the BI Applications.

In addition, Oracle recognizes that adoption is a critical success factor of any BI deployment. As such, they provide distinct versions of the pre-built applications geared toward a number of different vertical industries. These verticalized BI Applications provide dashboards and metrics that reflect the common needs across the given industries. Names of KPIs, dashboard components, chart types, and more may be different per industry solution. The top of Figure 12 reflects the various industries supported by Oracle's BI Applications.

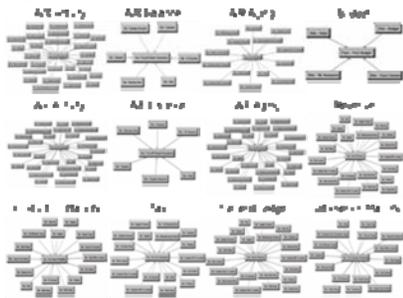


Figure 12: BI Applications Matrix

Oracle's BI Applications come complete with pre-built components for all facets of a succesful BI solution, as depicted in Figure 13 below. First, they provide pre-designed Data Warehouse table structures, with a number of different star schemas available for each functional area. They also provide pre-built ETL solutions which extract data from the thousands of tables typical in ERP

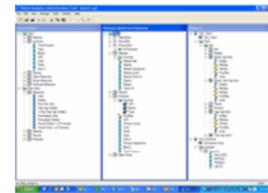
solutions and load it into the Data Warehouse structures. Next, each BI Application provides pre-mapped metadata for all three of the OBIEE layers: Presentation, Business Model, Physical. Finally, the Applications provide hundreds of pre-built metrics, dashboards and reports. With each of these four components designed and built based on business area and vertical industry “best practices”, the BI Applications combine a wealth of expertise into a comprehensive solution.

1 Pre-built warehouse with 15 star-schemas designed for Financial Analytics



3 Pre-mapped metadata, including embedded best practice calculations and metrics for Financial, Executives and other Business Users.

- Presentation Layer
- Logical Business Model
- Physical Sources



2 Pre-built ETL to extract data from over 3,000 operational tables and load it into the DW, sourced from SAP, PeopleSoft, Oracle EBS and other sources.



4 A “best practice” library of over 350 pre-built metrics, Intelligent Dashboards, Reports and alerts for CFO, Finance Controller, Financial Analyst, AR/AP Managers and Executives



Figure 13: Oracle BI Applications Components

However, even at that, it is understood that there may be features or functions which are not available in the BI Applications that you chose to deploy. As such, Oracle provides the capability for you to customize each of these components as you see fit. You can add your own table structures to the data warehouse, implement additional ETL as needed, create new metadata mappings or even adjust the dashboards and reports for your specific requirements. You have the flexibility to use the “best practice” components provides as-is, or merely think of them as libraries to customize as needed. Of course, one word of warning is due. Remember that any customizations which you implement may cause challenges as you later upgrade your BI Applications to newer revisions. Think seriously about these customizations before making them, just as you would with any ERP system customizations.

Behind all of the “flash” of the dashboards and reports, Oracle has done extensive process and workflow modeling to ensure that BI Applications meet your pressing analytical needs. Each dashboard component in the available “best practices” library was created in response to needs identified in a series of Analytic Workflows, as shown below in Figure 14, which depicts the Accounts Receivable component of the “Maximize Cash Flow” Analytic Workflow.

Implementing BI Applications as yet another commercial-off-the-shelf (COTS) solution provides a whole new way of thinking for organizations. With the ability to deploy BI solutions in a much more streamlined fashion than prior custom-built solutions, organizations can now look to provide effective BI solutions in months versus years, or weeks versus months. It also turns the effort of BI projects around, ensuring that they start and remain focused on business needs and not technical solutions.

Deploying BI Applications requires first and foremost that you understand the business needs driving your BI deployment and provide a clear vision of the KPIs required to effectively align your BI solutions with your organizations business strategy. From this understanding, your first consideration of the actual BI Application will be to evaluate the metrics it provides and compare them to your needed KPIs, producing a Gap Analysis. Using this Gap Analysis, you can now start to determine the features that the COTS BI Application will provide and those that you may still have to custom-build.

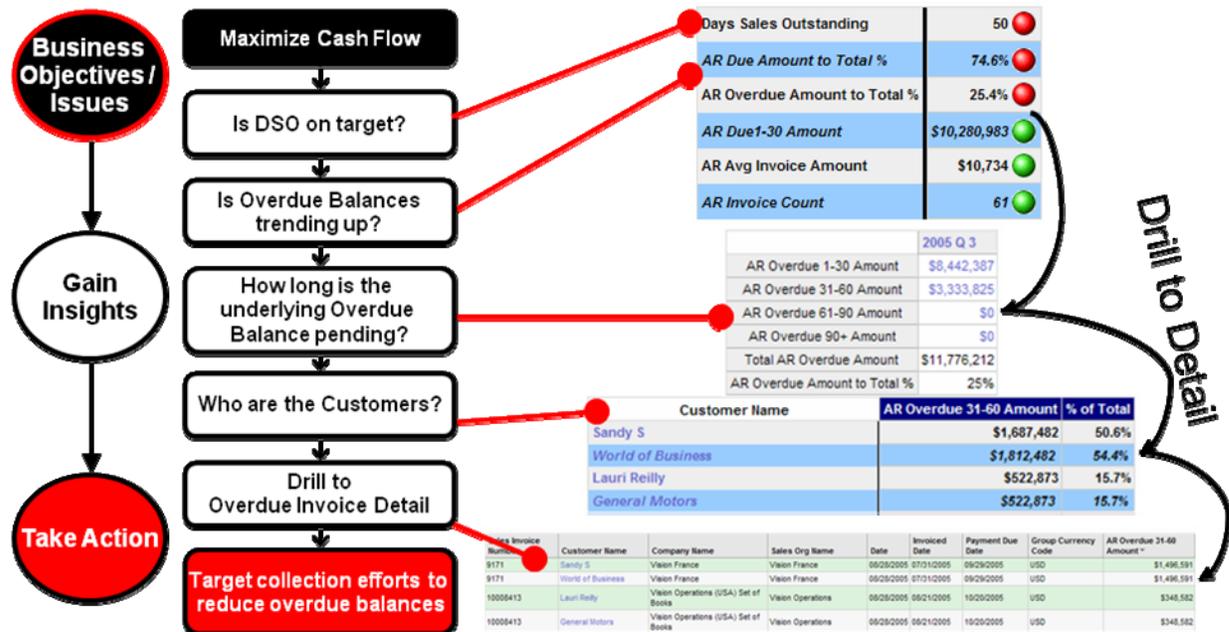
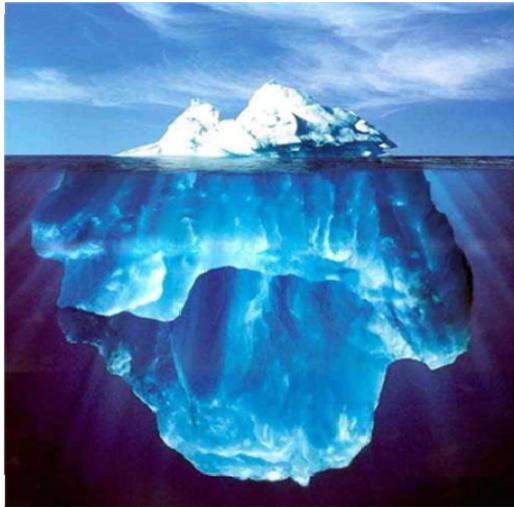


Figure 14: Analytic Workflow Example

Understanding the end-to-end Business Intelligence project lifecycle, it becomes clear how Oracle's BI Applications help streamline the delivery of BI solutions. While dashboards and "pretty" reports are the icing on the BI cake, BI development projects are akin to an iceberg. Typical of icebergs, the largest parts are always under the surface, with the most significant efforts of BI projects being the "unseen" plumbing such as designing and building the Data Warehouse, creating and debugging the ETL transformations and mapping metadata definitions. Oracle's BI Applications eliminate much of the "weight" of the "BI Iceberg" by providing the core plumbing components for you.



DASHBOARDS

- "Visible"



"PLUMBING"

- "Under the Surface"
- Significant Time, Resources and Expertise Required

➤ *Data Warehouse Design*

➤ *Data Mapping & Transformation from Multiple Applications*

➤ *Analytic Models, KPIs, Metrics*

➤ *Much More...*

Figure 15: The "BI Iceberg"

Welcome to the new BI Odyssey, where you can implement highly sophisticated, interactive BI solutions that facilitate strategic business decisions and drive critical actions – and do so with less time and effort!