OBIEE/Business Intelligence Applications Simplified

Vivek Jain, Managing Consultant, IBM (GBS)
Rahul Kundavaram, Senior Principal Consultant, Oracle
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Introduction

- Introduction to Business Intelligence / OBIEE
- Business Intelligence Applications
- Case Studies
  - Custom OBIEE Development
  - BI Applications
- Technical Details
- BI Center of Excellence
- Wrap-up / Questions & Answers
Vivek:
- OBIEE professional with IBM (Global Business Services) in Oracle Consulting Practice
- Skills in OBIEE, Oracle Spatial and MapViewer, OLAP/Essbase, Oracle RTD etc
- Many years of hands-on experience with many Fortune 100 companies in all of these areas
Why Oracle BI EE (OBI EE)?

- Age old Enterprise BI Industry Challenges
  - No effective way to analyze requirements
    - “It took us two years to build the enterprise DW, and it is not being fully utilized since being built.”
  - Reporting silos
    - Silo data marts or cubes; query tool silos
    - Batch-based reporting deployed as dead “sheets of paper”
  - Low user adoption
    - Hard-to-use
    - Poor performance
    - High TCO
    - Not actionable or relevant
    - Too late; not detailed enough
Why is Oracle BI EE different?

- Solutions versus tools
  - OBI EE Platform
    - Flexibility for functionality extensions
    - Application administration for TCO
  - Model-driven applications methodology minimizes requirements surprises
- Enterprise versus departmental
  - Enterprise Information Model -- versus hundreds of cubes
  - Handles large data volumes by function shipping to the database
  - Minimizes the use of temp tables to exploit the database optimizer
- Pervasive
  - Ad hoc analysis for business users via interactive dashboards
  - Business problem orientation: analytic workflows and guided navigation
  - Open APIs to fit underneath existing operational systems UI -- SOAP Services for UI reuse or odbc for data / business logic re-use only
- Unified server-centric architecture with full thin client UI
OBIEE – Three Layers

**PRESENTATION LAYER**
- User Roles, Preferences
- Simplified View
- Logical SQL Interface

**SEMANTIC OBJECT LAYER**
- Dimensions
- Hierarchies
- Measures
- Calculations
- Aggregation Rules
- Time Series

**PHYSICAL LAYER**
- Map Physical Data
- Connections
- Schema

Role-Based Views of the Information Relevant to the User

Consistent Definition of Business Measures, Metrics, Calculations

Model Once, Deploy Everywhere

Across Any Data Sources
Ideal Information Architecture

Orchestration

Applications

Data Warehouse

Data Marts Reporting

Business Intelligence

- CRM Apps
- SCM Apps
- Operations
- Websites
- Financials
- Distribution
- ERP Apps
- HCM Apps

EAI

ETL

(OLAP)

Essbase
ERP systems like Oracle EBS are excellent in capturing business data. A data warehouse/OBIEE leverages ERP data for analysis. It also gathers data from multiple systems: Legacy, Demantra, etc.
Two Scenarios – User of OBIEE

- **Company A (Printing/Packaging Industry)**
  - ERP is JD Edwards and Legacy
  - IBM H/W and AIX shop
  - EPM - System 7 to System 11 Migration
  - ODS / Crystal Reports
  - Essbase & Demantra (for S&OP)

- **Company B (Energy Sector)**
  - One Division SAP, rest legacy, EBS R12 to consolidate into one ERP
  - SAP tools for Reporting, Crystal
  - New HFM and Planning (System 11)
OBIEE v/s Packaged BI Application

CRM ANALYTICS
- Sales
- Service and Contact Center
- Marketing
- Loyalty
- Price

ERP ANALYTICS
- Procurement and Spend
- Supply Chain and Order Management
- Human Resources
- Financials
- Projects
- Supply Chain and Order Management
- Human Resources
- Financials
- Projects

ORACLE BI ENTERPRISE EDITION (OBIEE)

AND OTHER OPERATIONAL AND ANALYTIC SOURCES
Example 10g Deployment High Availability
Oracle BI 11g High Level Architecture

Oracle BI Domain

WebLogic Domain

Admin Server
- Admin Console
- Enterprise Mgr

Managed Server
- Action Service
- BI Office
- BI Publisher
- Web Service SOA
- BI Plugin
- Security

Node Manager

Oracle BI System Components

- BI Server
- BI Scheduler
- BI Presentation Server
- BI Java Host
- Cluster Controller

OPMN

Supporting Database Schemas (Created by RCU)
Oracle BI 11g Clustering

Oracle BI Domain

Machine 1

WebLogic Domain

Managed Server | Cluster Node 1

Node Manager

Managed Server | Cluster Node 2

Node Manager

Admin Server

Admin Console

Enterprise Mgr

BI System Component Cluster

Oracle BI System Components

Machine 1

Machine 2
OBIEE 11g

- New Features
  - Olap Style reporting
  - ADF integration
  - Actions Framework
  - Security

- Ragged and Skip level hierarchies

- Essbase Integration

- Mapping – Mapviewer integration
Business Model Support for Leveled-Ragged and Skip

- Ragged and Skip Checkboxes
  - Tells server to check for NULL member names in SQL
  - Slight performance hit – only do this when necessary

- Ragged or Skip in Relational Source
  - Missing node should be a NULL field for the member name
# Nulls for Skip or Ragged Levels

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Nulls for skip level
Oracle BI Server 11gR1 Enhancements for Essbase

- Essbase MDX enhancements to support Answers+
  - Hierarchy and member browsing
  - Member selection steps
- Improved support for:
  - Measures/Accounts hierarchies
  - Aliases
  - User Defined Attributes (UDAs)
  - Value-based hierarchies
- Enhanced capabilities for federating Essbase and relational sources
Richer Essbase Metadata in OBIEE Admin Tool

- Ability to create columns for UDAs
- Ability to create columns for Alias tables
- Measure hierarchy modeling
- Value-hierarchy modeling
- Alternate hierarchies automatically imported as separate hierarchies
- Member order column
MapViewer BI Integration Architecture

- **Mapbuilder**: Basemaps/themes/styles manager (thick client)
- **NSDP** (Non-Spatial Data Provider) key MapViewer integration feature

MapViewer integrates with
- **Oracle Spatial Database**
- **JSON/XML** formats
- **Oracle Fusion Middleware**
- **Other Oracle/non-Oracle databases, data warehouses…**
- **OBIEE** (Oracle Business Intelligence Enterprise Edition)
BI Presentation Services (Admin)

- Import themes, tile layers, styles created in mapviewer into the OBIEE catalog creating a central repository and associate subject areas with the maps
- Provide mapping between BI metadata and Mapviewer metadata
- Provide layer ordering, zoom levels on the map
About Me!

Rahul Kundavaram:

- Senior Principal Consultant in Oracle – BI Practice
- Skills in OBIEE / BI Applications, Discoverer, BI Publisher, Oracle EBS
- 10+ Years of experience in all these areas
Acronyms

- OBIEE
- OBIA
- OLAP, OLTP, OBAW
- DAC
- INFA
- SDE (Source Dependent executions)
- SIL (Source Independent executions)
- Fin, SCM, HR…
OBIEE v/s Packaged BI Application

Sales

Marketing

Procurement and Spend

Financials

Loyalty

Price

Supply Chain and Order Management

Projects

Service and Contact Center

CRM ANALYTICS

ERP ANALYTICS

Human Resources

ORACLE BI ENTERPRISE EDITION (OBIEE)

ORACLE

PeopleSoft

Siebel

JD Edwards

SAP

AND OTHER OPERATIONAL AND ANALYTIC SOURCES
Traditional Circular Join
OBIEE – Logical Star
How to decide what BI application are Available for a Given ERP system?

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### BI Applications (OBIA) – Downloading the Different Components

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- **Download** Oracle Business Intelligence Applications 7.9.6
  - V16390-01
  - 319M
- **Download** Oracle Business Intelligence Data Warehouse Administration Console 10.1.3.4.1 for Microsoft Windows
  - V16377-01
  - 181M
- **Download** Informatica PowerCenter and PowerConnect Adapters 8.6.0 for Windows x86 (32-bit) (Part 1 of 2)
  - V16329-01
  - Part 1 of 2
  - 1.1G
- **Download** Informatica PowerCenter and PowerConnect Adapters 8.6.0 for Windows x86 (32-bit) (Part 2 of 2)
  - V16329-01
  - Part 2 of 2
  - 977M
Welcome to the InstallShield Wizard for Oracle Business Intelligence Applications 7.9.6.2

The InstallShield Wizard will install Oracle Business Intelligence Applications 7.9.6.2 on your computer. To continue, choose Next.

Oracle Business Intelligence Applications 7.9.6.2
Oracle Corporation
www.oracle.com
Install Process

- End user machines requires no software, browser based assess
- Windows boxes required for client software and for transferring some server software (A and B)
- Co-location of Informatica PowerCenter Services and DAC Server – C
- Clients can be installed on multiple Windows boxes
Supporting Infrastructure – Informatica and DAC
High Level Data Flow

- Source – eBS/PSFT/Siebel/JD Edwards/Custom (Raw Data)
- ETL – Extraction Transform and Load (Informatica – PowerCenter or ODI)
- OBAW - Business Analytics Warehouse
- OBIEE Metadata
- OBIEE Content – Reports and Dashboards
OBIEE – From Surface to Plumbing

Oracle Dashboards

Oracle Answers

REPORTS & DASHBOARDS
“Visible”

Report Definitions & Metadata Repository

Oracle BI Server

“Invisible” PLUMBING

Job Flows  Extracts  Staging Area  Transform/Load  Facts/Dimensions  Metadata

Data Capture

AGG
DIM  FACT  DIM
AGG

Physical  Logical  Presentation
Value Added to the Layered Architecture

- Metrics used in Reports & Dashboards
- Metrics in Subject Areas
- Metrics in Logical Layer
- Metrics in Physical Warehouse

Not all measures in presentation layer used in reports & dashboards

Subset of logical measures are exposed in presentation layer

Aggregations, time series calculations and derived calculated measures extend physical measures

Measures from physical columns in data warehouse
Effort v/s Customization Balance

- **Dashboards & Reports**: Easy
  - Additional dashboards and reports, guided and conditional navigations, iBots, etc.

- **OBIEE Metadata**: Moderate
  - Additional derived metrics, custom drill paths, exposing extensions in physical, logical and presentation layer, etc.

- **DW Schema**: Intermediate
  - Extension of DW Schema for extension columns, additional tables, aggregates, indices, etc.

- **ETL**: Involved
  - Extension of ETL for extension columns, descriptive flexfields, additional tables, etc.
User’s of Pre Packaged OBIEE

- **Company A (Non Profit)**
  - ERP is Siebel and EBS
  - IBM H/W and AIX shop
  - ODS / Crystal Reports
  - Cognos for Planning and Budgeting

- **Company B (Energy Sector)**
  - One Division SAP, rest legacy, EBS R12 to consolidate into one ERP
  - SAP tools for Reporting, Crystal
  - New HFM and Planning (System 11)
JD Edwards Tables

- The JD Edwards table names are quite cryptic
- This shows that building custom OBIEE solutions requires deep ERP knowledge
- Need for data modeler, ETL/OBIEE architect and developers
General Challenges with BI Projects

• Users often want one place / tool for Operational and Analytical reporting
  • Degree of details in warehouse
  • Right time data – need for intra-day ETL
  • Highly Formatted reports

• Security model across BI and Source Systems.
Managing the OBIEE Project

• Quick Dev / Test environment install for OBIEE Socialization

• Show customer’s data and invite users to start playing with it to Create a Dashboard Envy

• Fit Gap Analysis

• Iterate and fine tune the system
Summary / Questions

- Recap OBIEE
- Recap BI Applications
- Technical Details
- Questions

Contact Information:
The business intelligence competency center is essential to an business intelligence strategy. It can effectively address critical challenges such as education, staffing, planning and organizational support & execution.

**BI Competency Center Is Core to BI Success.** Gartner
Why BI-CoE

We need better information faster

Systems are complex

Many products, many applications

Limited resources

Global teams, often times with outsourcing

Shrinking budgets

Relevance At company

✓✓

✓✓

✓✓

✓✓

✓
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<td>DL Load into Oracle OLTP Fact</td>
<td>SDE_DL_Oracle_EBS_Fact_Incremental</td>
<td></td>
<td>SDE_DL_Oracle_EBS_Fact_INcremental</td>
<td></td>
<td>Load</td>
</tr>
<tr>
<td>DL Load into RPD Fact</td>
<td>SDE_DL_RPD_Fact_Incremental</td>
<td></td>
<td>SDE_DL_RPD_Fact_Incremental</td>
<td></td>
<td>Load</td>
</tr>
<tr>
<td>DL Load into Table Column Dimension</td>
<td>SDE_DL_Table_Column_Dimension</td>
<td></td>
<td>SDE_DL_Table_Column_Dimension_Incremental</td>
<td></td>
<td>Load</td>
</tr>
<tr>
<td>DL Load into Webcast Dashboard</td>
<td>SDE_DL_Webcast_Dashboard</td>
<td></td>
<td>SDE_DL_Webcast_Dashboard_Incremental</td>
<td></td>
<td>Load</td>
</tr>
<tr>
<td>DL Load into Webcast Request Fact</td>
<td>SDE_DL_Webcast_Req</td>
<td></td>
<td>SDE_DL_Webcast_Req_Incremental</td>
<td></td>
<td>Load</td>
</tr>
<tr>
<td>DL Update ETL Flag</td>
<td>SDE_DL_Table_Column_Dimension</td>
<td></td>
<td>SDE_DL_Table_Column_Dimension_Incremental</td>
<td></td>
<td>Load</td>
</tr>
</tbody>
</table>

**Conditional Tables**

- **Name:**
  - DL Extract ETL metadata
- **Folder Name:**
  - Extract
- **Task Phase:**
  - Extract Fact

**Description**

- **Command for Incremental Load:**
  - SDE_DL_info
- **Primary Source:**
  - DBConnection_INFA

**Source Tables**

- **Target Tables**

**Save**

**Undo**
<table>
<thead>
<tr>
<th>Name</th>
<th>Data Type</th>
<th>Load Type</th>
<th>Value</th>
<th>Inactive</th>
<th>Owner</th>
</tr>
</thead>
<tbody>
<tr>
<td>$$ANALYSIS_END</td>
<td>Timestamp</td>
<td>Both</td>
<td>Custom Format(2011-01-01...)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$$ANALYSIS_END_WID</td>
<td>Timestamp</td>
<td>Both</td>
<td>To Wk(2011-01-01...)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$$ANALYSIS_START</td>
<td>Timestamp</td>
<td>Both</td>
<td>Custom Format(2011-01-01...)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$$ANALYSIS_START_WID</td>
<td>Timestamp</td>
<td>Both</td>
<td>To Wk(2011-01-01...)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$$COST_TIME_GRAIN</td>
<td>Text</td>
<td>Both</td>
<td>QUARTER</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$$CURRENT_DATE</td>
<td>Timestamp</td>
<td>Both</td>
<td>Custom Format(2011-01-01...)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$$CURRENT_DATE_IN_SQL_FORMAT</td>
<td>Timestamp</td>
<td>Both</td>
<td>SQL Syntax (Date)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$$CURRENT_DATE_TIME_IN_SQL_FORMAT</td>
<td>Timestamp</td>
<td>Both</td>
<td>SQL Syntax(@O...</td>
<td></td>
<td></td>
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<tr>
<td>$$CURRENT_DATE_WID</td>
<td>Timestamp</td>
<td>Both</td>
<td>To Wk(2011-01-01...)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$$DATASOURCE_NUM_ID</td>
<td>Text</td>
<td>Both</td>
<td>@DAC_DATASO...</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$$DEFAULT_LOC_RATE_TYPE</td>
<td>Text</td>
<td>Both</td>
<td>Corporate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$$DEFAULT_LANG</td>
<td>Text</td>
<td>Both</td>
<td>Corporate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$$ETL_PROC_WID</td>
<td>Text</td>
<td>Both</td>
<td>@DAC_CURRE...</td>
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</tbody>
</table>

*Name:*

$\$ANALYSIS\_END

*Data Type:*

Timestamp

*Load Type:*

Both

*Value:*

Custom Format(2011-01-01...)

Inactive: [ ]

Save

Undo
<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
<th>Default value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analyze Frequency (in days)</td>
<td>14</td>
<td>7</td>
</tr>
<tr>
<td>Analyze Table After Query Index Creation</td>
<td>false</td>
<td>true</td>
</tr>
<tr>
<td>Auto Restart ETL</td>
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<td>false</td>
</tr>
<tr>
<td>DAC Alternate Server Hosts</td>
<td>localhost</td>
<td>Unspecified</td>
</tr>
<tr>
<td>DAC Server Host</td>
<td>localhost</td>
<td>localhost</td>
</tr>
<tr>
<td>DAC Server OS</td>
<td>Windows</td>
<td>Windows</td>
</tr>
<tr>
<td>DAC Server Port</td>
<td>3141</td>
<td>3141</td>
</tr>
<tr>
<td>Drop and Create Change Capture Views Always</td>
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<td>true</td>
</tr>
<tr>
<td>Dryrun</td>
<td>false</td>
<td>false</td>
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<tr>
<td>Generic Task Concurrency Limit</td>
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<td>10</td>
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<tr>
<td>HeartBeatInterval</td>
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<td>900</td>
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<td>D:\Informatica\PowerCenter8.0.1\server\infash...</td>
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<tr>
<td>No Run</td>
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<td>false</td>
</tr>
<tr>
<td>Output Redirect</td>
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<td>false</td>
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<td>Repository DB Pool Size</td>
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<td>Repository Name</td>
<td>AA_7961</td>
<td>DAC Repository</td>
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<td>SQL Trace</td>
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<td>Scheduler Poll Interval</td>
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<td>Script After Every ETL</td>
<td>post_ell.bat</td>
<td>post_ell.bat</td>
</tr>
<tr>
<td>Script Before Every ETL</td>
<td>pre_ell.bat</td>
<td>pre_ell.bat</td>
</tr>
<tr>
<td>Server Log Level</td>
<td>SEVERE</td>
<td>SEVERE</td>
</tr>
<tr>
<td>Test Run</td>
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<td>false</td>
</tr>
<tr>
<td>Verify And Create Non-Existing Indices</td>
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<td>false</td>
</tr>
<tr>
<td>Worker Pool Size</td>
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<td>50</td>
</tr>
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<td>Name</td>
<td>Type</td>
<td>Connection Type</td>
</tr>
<tr>
<td>--------------</td>
<td>------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>DataWarehouse</td>
<td>Warehouse</td>
<td>Oracle (OCB)</td>
</tr>
<tr>
<td>FlatFile</td>
<td>Other</td>
<td>Flat File</td>
</tr>
<tr>
<td>ORA_R1211</td>
<td>Source</td>
<td>Oracle (OCB)</td>
</tr>
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<td>ORA_R1211_FL</td>
<td>Source</td>
<td>Flat File</td>
</tr>
<tr>
<td>SEEL_VERT_811</td>
<td>Source</td>
<td>Oracle (OCB)</td>
</tr>
<tr>
<td>SEEL_VERT_811</td>
<td>Source</td>
<td>Flat File</td>
</tr>
<tr>
<td>UNIV</td>
<td>Source</td>
<td>Flat File</td>
</tr>
</tbody>
</table>

* *Name:* DataWarehouse  
 * *Type:* Warehouse  
 * *Connection Type:* Oracle (OCB)  
 * connection:* OLAP  
 * *Table Owner:* DWUSR  
 * *Max Num Connections:* 10  
 * *DB Host:*  
 * *Port:*  
 * *Dependency Priority:* 10  
 * *Data Source Number:* 1  

* TNS Name: CLAP  
 * Table Owner: DWUSR  
 * Table Owner Password: **********  
 * Max Num Connections: 10  
 * DB Host:  
 * Port:  
 * Dependency Priority: 10  
 * Data Source Number: 9  
 * Default Index Space: DWUSER_IDX  

* Num Parallel Indexes Per Table: 1  
* JDBC Driver (Optional):  
* URL (Optional):  

Save  
Test Connection  
Undo
SDE_ORAR1211_Adaptor
SILOS