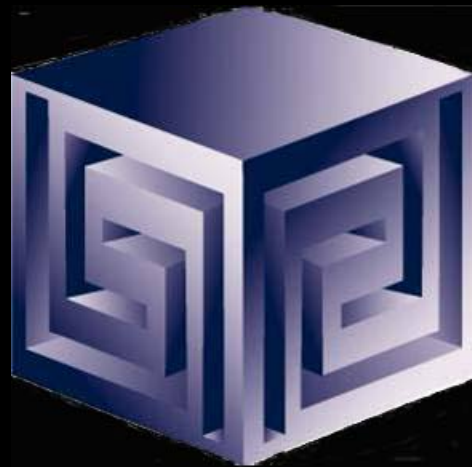


An End-to-End Solution Using OWB and JDeveloper to Analyze Your Data Warehouse

Presented at ODTUG 2003



Dan Vlamis

dvlamis@vlamis.com

Vlamis Software Solutions, Inc.

(816) 781-2880

<http://www.vlamis.com>

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VlamiS Software Solutions, Inc.

- **Founded in 1992 in Kansas City, Missouri**
- **Oracle Certified professional services company**
- **Provides business solutions to international and domestic clients based on Oracle technologies.**
- **Authorized software reseller**
- **Creator of the first Oracle 9i Business Intelligence and Analytics tool.**
- **Core competency include:**
 - ☐ **Certified designers,**
 - ☐ **Developers,**
 - ☐ **Implementers**
 - ☐ **Nationally recognized technical authors, speakers and publishers.**



Agenda

- **Introduction**
- **Using Oracle Warehouse Builder to OLAP
Enable the Warehouse**
- **Enabling an Existing Star Schema for OLAP**
- **Managing the Analytic Workspace**
- **Developing BI Applications using
JDeveloper and BI Beans**

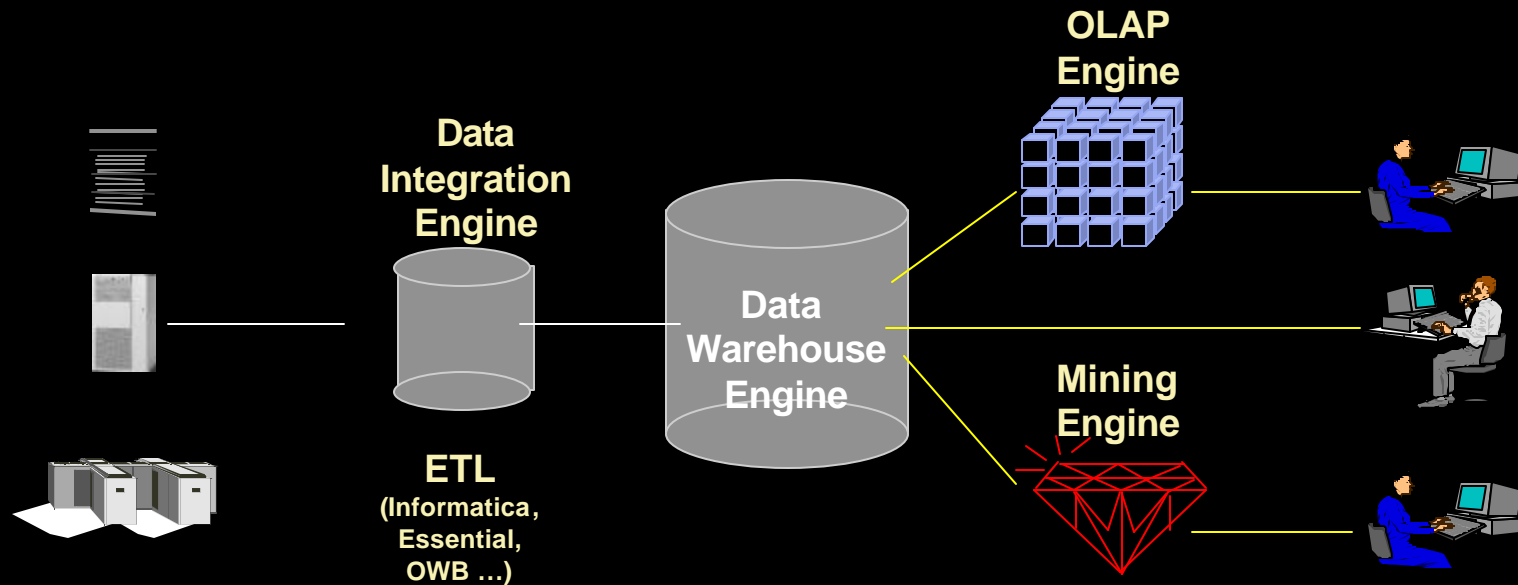


In the Past

- **Previous development of BI and OLAP Applications required proprietary development environment**
- **Each deployment model required a different tool**
- **Development effort very labor intensive**
- **Concept to Deployment takes long time**
- **Requires specialized skills**



Business Intelligence the Old Way

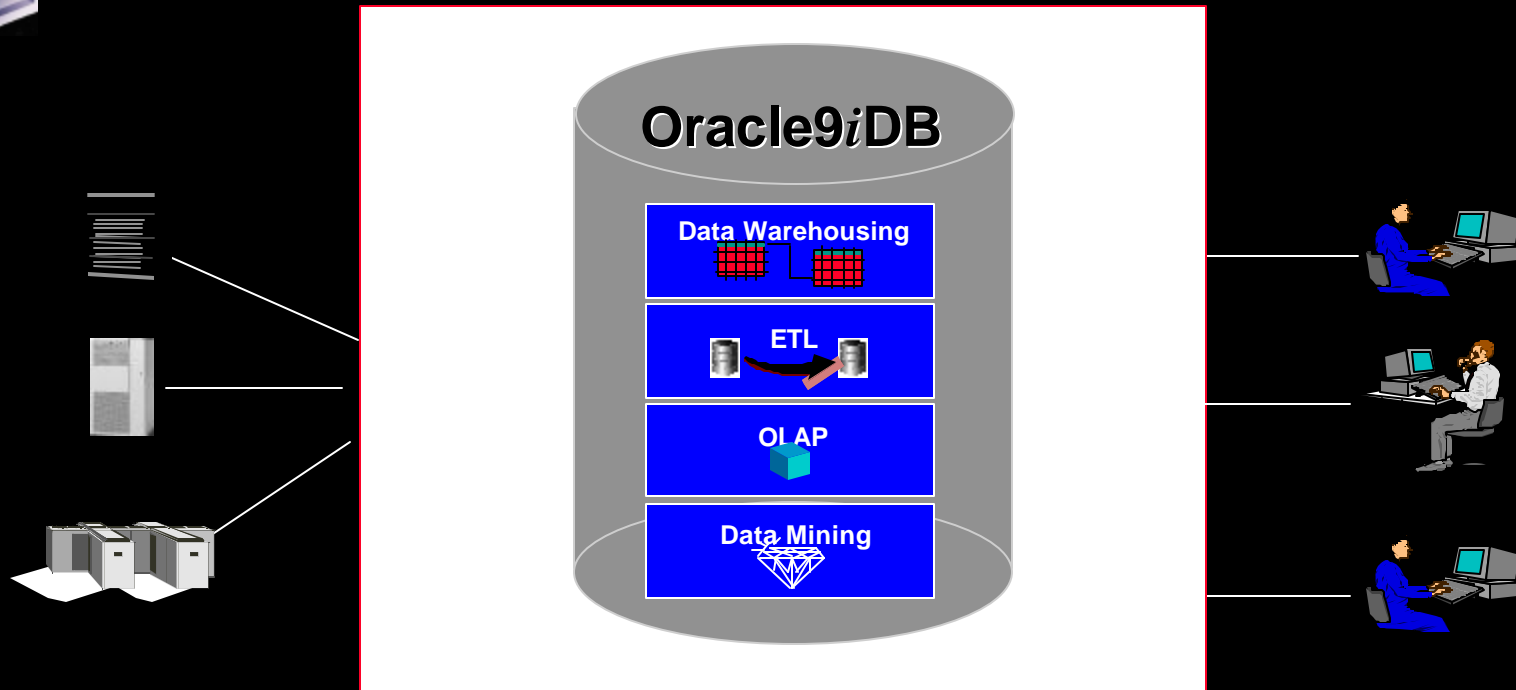


Special purpose engines for differing tasks

- Metadata migration tools ease replication
- User interfaces generally different for different tools

Thin Client Demo

BI the New Way: Oracle 9iDB



- Single business intelligence platform
 - Reduce administration, implementation costs
 - Faster deployment & Improved scalability and reliability

Thin Client Demo



Oracle 9i and OLAP – What Is It?

- Advanced analytics
- Integrated in RDBMS
- Common Metadata
- Easy to develop
- Easy to use
- Facilitate collaboration
- Flexible deployment
- Scaleable and performant

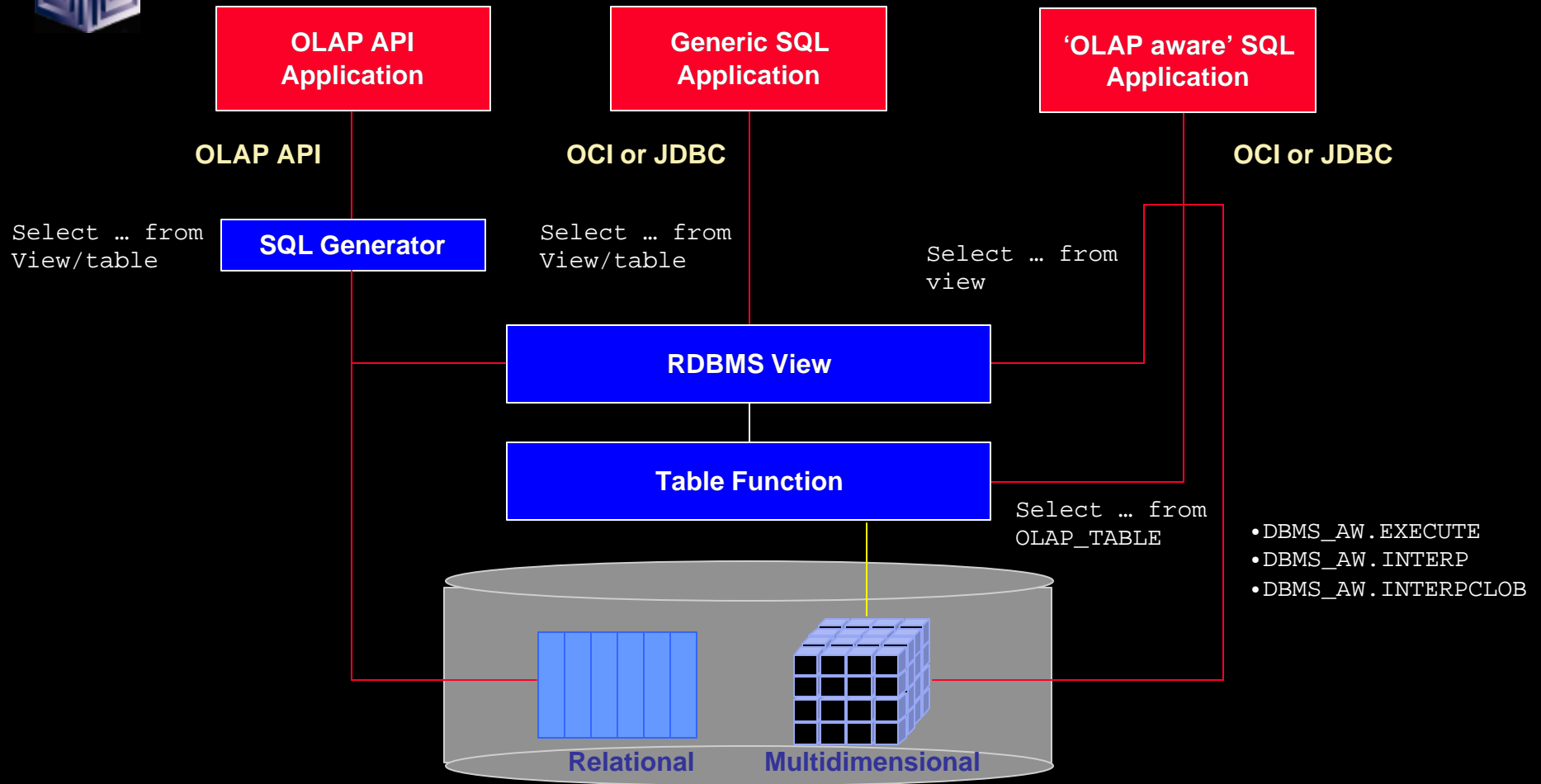


Analysis Functions

Oracle 9i Supports

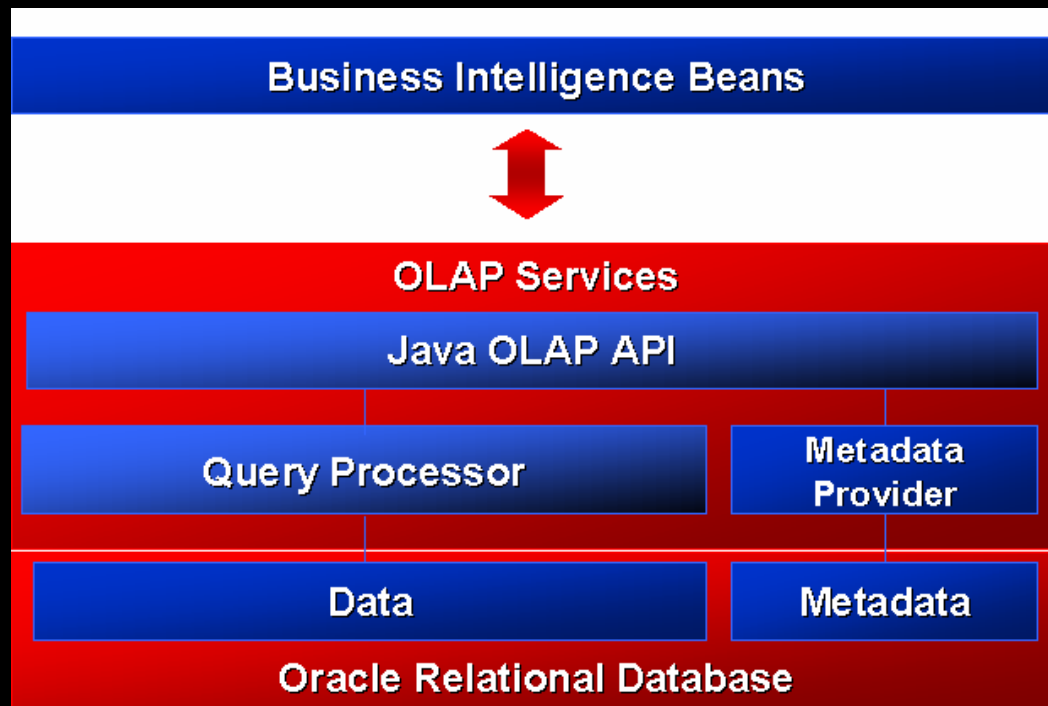
- **Ranking family**
- **Window Aggregate**
- **Reporting Aggregate family LAG/LEAD**
- **Linear Regression family**
- **Inverse Percentile family**
- **Hypothetical Rank and Distribution family**
- **FIRST/LAST Aggregates family**

Query Methods





Oracle 9i OLAP Architecture



**Rapid application development
Analysis ready**

**Java OLAP API
Predictive analysis functions**

**Scaleable data store
Integrated meta data
Summary management
SQL analytic functions**



Simple Java OLAP API Example

English

Select the products where the dollars measure is greater than 1,000,000 for geography Miami for time period Jun2003.

Express

```
limit geography to 'MIAMI'  
limit time to JUN2003'  
limit product to dollars gt 1000000
```

Java
OLAP
API

```
Source geogSel = geography.selectValue("MIAMI");  
Source timeSel = time.selectValue("JUN2003");  
Source dolByProd = dolSrc.join(geogSel).join(timeSel);  
Source prodSel = product.select(dolByProd.gt(1000000));  
Source dolGT1Mill =  
    dolSrc.join(geogSel).join(timeSel).join(prodSel);
```



Deployment Models

- **Deploying BI Beans Apps**
 - ❑ **Thick Java Client – feature Rich!**
 - ❑ **Thin Client – More limited**
 - **JSPs**
 - **Servlets**
 - **UIXml**
 - **Oracle Portal Portlets**
 - ❑ **Reports 9i OLAP plug-in**
 - ❑ **Excel Add-in (Fall 2003)**

Questions?





What is Oracle Warehouse Builder?

- **Integrated Tool for Data Warehousing**
- **Based on Common Warehouse Metadata Standard (OMG)**
- **Supports Design and ETL Functions**
- **Enterprise Framework for Designing and Deploying Datawarehouses and Datamarts**



What is OWB?

Components: Overview

Components of Oracle Warehouse Builder

- ☐ Repository (CWM)
- ☐ Graphical User Interface
- ☐ Code Generator
- ☐ Integrators
- ☐ OWB Bridge



Components: *OWB Repository*

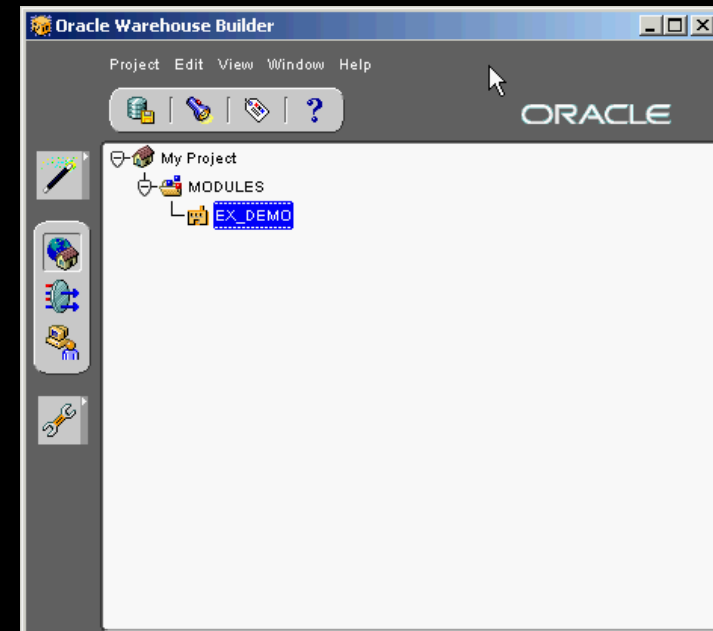
- **Based upon Common Warehouse Metadata Standard (CWM)**
- **Supports Industry Standards**
- **Oracle 8i/9i based**
- **Integration point for future products (Designer, Developer, BI Beans ...)**



Components: *OWB User Interface*

Java Based

- Same look and feel as Designer 6i
- Run on Thin Client Platform





Components: *Code Generators*

Code Generators are provided for:

- ☐ Transformations
- ☐ DDL
- ☐ SQL Loader scripts
- ☐ User Defined transformations



Components: *Integrators*

- **Several Integrators provided**
- **Relational and non-relational support**
- **Oracle Applications Data Source**
- **SAP R/3 Data Source**
- **Discoverer**
- **Express**
- **CWM**
- **Oracle 9i OLAP**



Components: *OWB Transfer Wizard*

- **Bridging technology to 9i OLAP, Express, CWM and Discoverer**
- **Support for two-way to 9i OLAP**
- **At present only supports One Way to Express RAM metadata**
- **No support for Express MOLAP**



9i OLAP Integration

- **OWB Bridge transports OWB metadata to Oracle 9i OLAP Metadata**
- **Creates links to Relational Data for Facts and Dimensions**
- **Can make changes in OWB or OEM Cube Builder, but OWB won't know about OEM changes**



The Process in OWB

- **Design or Import Relational Schema**
 - ☐ Define Dimensions
 - ☐ Define Cubes (Facts)
 - ☐ Define Materialized Views (summary tables)

Note: Special MVs for OLAP created as part of the OWB to OLAP Bridge process
- **Create Physical Schema Script**
- **Create Script for 9i OLAP**
- **Run Script(s)**
- **View in OEM/Cube Builder**
- **Run Application**
- **Gather Statistics / Tune**

Demonstration

Cube Design and Generation using OWB



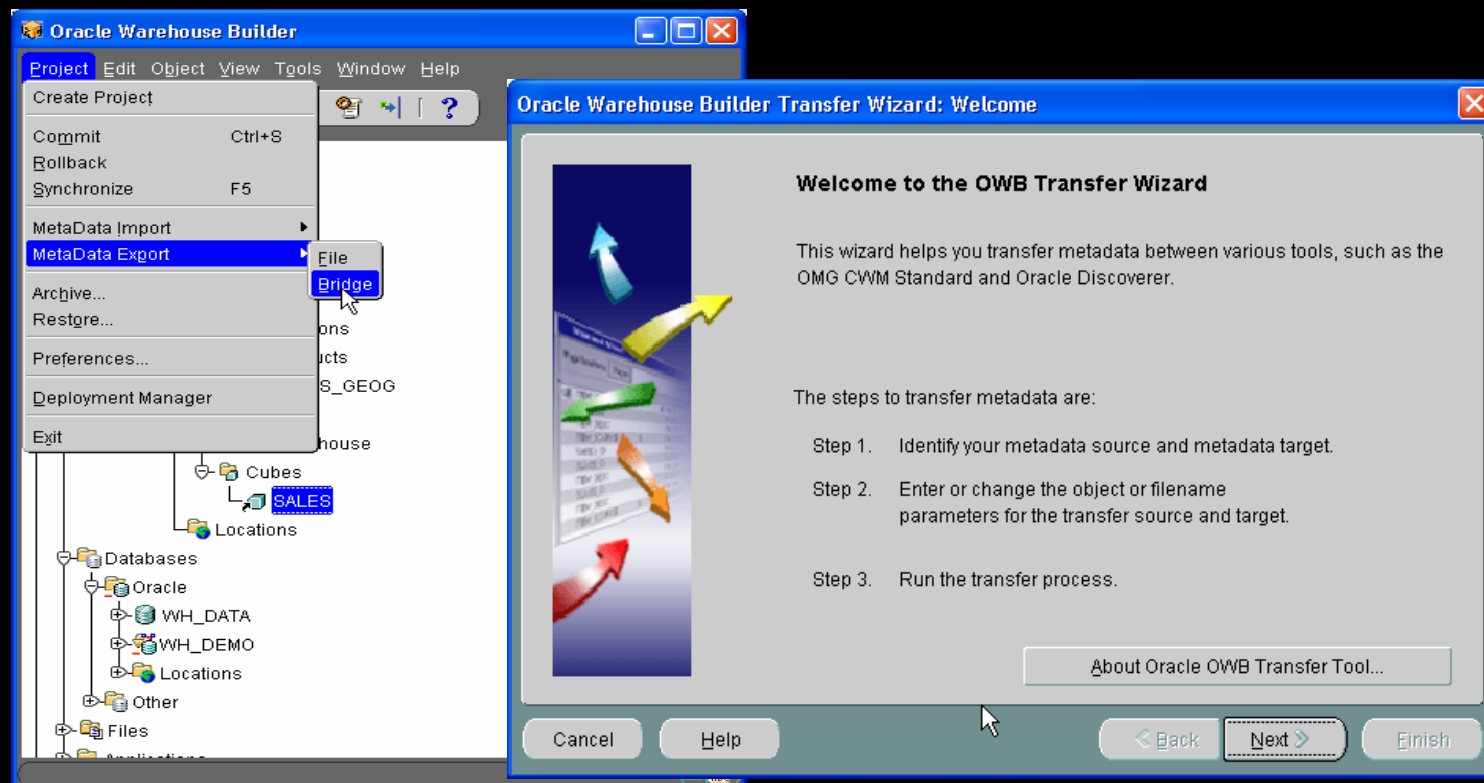


OWB Transfer Wizard

- **What does the OWB to 9i OLAP Transfer do?**
 - ☐ **Converts Metadata to CWM Format**
 - ☐ **Create SQL Script to update 9i OLAP Metadata**
 - ☐ **Creates scripts for Materialized Views if needed**
 - ☐ **Executes Script**
 - ☐ **Allows for Building AW Cubes**
 - ☐ **Moves Data from relational to AW**



Metadata Export - Bridge





OWB Transfer – Choose Destination

Oracle Warehouse Builder Transfer Wizard, 1 of 3: Metadata Source and Target Identification

Source and Target Metadata Locations

The product that contains the metadata

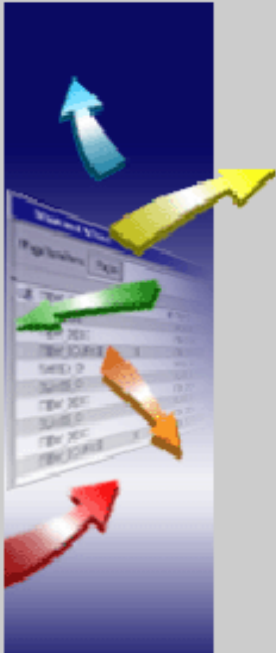
From:

Select the product where you want to transfer the metadata

To:

Enter a description (optional)

Description:





OLAP Bridge – Transfer Parameters

Oracle Warehouse Builder Transfer Wizard, 2 of 3: Transfer Parameter Identification

Metadata Object/Filenames and Detailed Transfer Parameters

Enter or change the transfer parameter values.

Transfer Parameter Name	Transfer Parameter Value
OWB Exported Collections	DEMO
OWB Translated Language	American English
Deploy to AW	Yes
AW Name	DEMOAW
AW Object Prefix	AW_
Generate View Definitions	Yes
Generated View Prefix	

Generate the view definitions for the Analytic Workspace. These are generated on the database server filesystem.

Cancel Help Back Next Finish



OLAP Bridge – Transfer Parameters

Oracle Warehouse Builder Transfer Wizard, 3 of 3: Summary

Confirmation of Oracle WB Transfer

From: To:

Description:

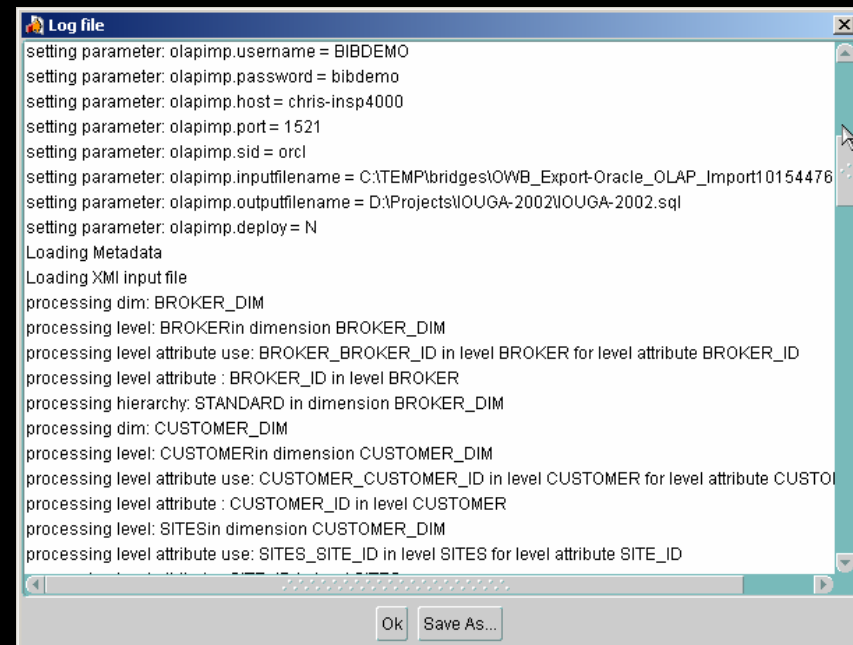
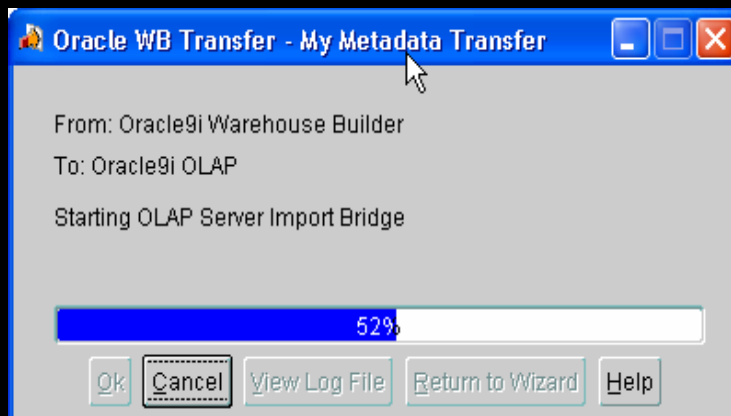
Transfer Parameter Name	Transfer Parameter Value
OWB Exported Collections	DEMO
OWB Translated Language	American English
Deploy to AW	Yes
AW Name	DEMOAW
AW Object Prefix	AW_
Generate View Definitions	Yes
Generated View Prefix	

Click Finish to begin the transfer process.

Cancel Help < Back Next > Finish



CWM Bridge – Running



Demonstration

OWB to 9i OLAP Bridge





OEM Cube Builder – The Results

Oracle Enterprise Manager Console, Standalone

File Navigator Object Tools Configuration Help

Network

- Databases
 - ORCLVSS - vssdemo
 - Instance
 - Schema
 - Security
 - Storage
 - Distributed
 - Warehouse
 - OLAP
 - Measure Folders
 - Cubes
 - DEMO
 - SH
 - VSSDEMO
 - DEMO_SALES_CUBE**
 - Dimensions
 - VSSDEMO.CHANNEL
 - VSSDEMO.GEOGRAPHY
 - VSSDEMO.PRODUCTS
 - VSSDEMO.T_TIME
 - Measures
 - Materialized Views
 - Summary Management
 - Workspace
 - XML Database

General Dimensions Measures Aggregation Solve Order Topology

VSSDEMO.DEMO_SALES

Foreign Keys / Measures	
FK_DEMO_SALES_CHAN	
FK_DEMO_SALES_GEO	
FK_DEMO_SALES_PROD	
FK_DEMO_SALES_TIME	
COST	
PROMO	
QUOTA	
REVENUE	
UNITS	

CHANNEL

Levels
ALL_CHANNELS
CHANNEL

GEOGRAPHY

Levels
ALL_GEOG
AREA
CITY
CONTINENT

PRODUCTS

Levels
ALL_PROD
DIVISION
GROUPS
PRODUCT

T_TIME

Levels
L_MONTH
L_QUARTER
L_YEAR

Apply Revert Show SQL Help

Questions?





Relational or Analytic Workspace?

- **Relational**
 - ☐ Very large data sets
 - ☐ Very sparse data
 - ☐ Need to query with complex SQL
- **Analytic Workspace**
 - ☐ Summary level or relatively dense data
 - ☐ Complex, multidimensional calculations
 - ☐ Planning functions
 - ☐ What-if analysis
 - ☐ Computational scalability
 - ☐ Complex joins



Administration and Moving to AW

- **Administration of OLAP Option and Cubes is performed using OEM**
- **New Tools for Analytic Workspace – AW Manager**
- **Using OLAP DML and OLAP Worksheet**



What are Cubes?

- **Relational cubes include**
 - ☐ Star schema
 - ☐ OLAP catalog metadata
 - ☐ Summary data in materialized views
- **Analytic workspace cube include**
 - ☐ Analytic workspace built to the database standard form specification
 - ☐ Relational views over analytic workspace
 - ☐ OLAP catalog metadata

Cube Built by OWB





Using OEM to Build Cubes

- **Start with Warehouse**
 - ☐ Star schema
 - ☐ Tables for Dimensions and Fact tables
- **Use OEM Cube Builder**
 - ☐ Define Dimensions and map to dimension tables
 - ☐ Create levels and hierarchies in Dimensions
 - ☐ Special Time dimensions
 - ☐ Create cubes from Fact tables
 - ☐ Organize measures into Folders



Defining Relational Cubes

- **Start with a star schema**
- **Add OLAP catalog metadata**
 - ☐ **OLAP catalog API**
 - ☐ **OLAP tool in Oracle Enterprise Manager**
 - ☐ **Oracle Warehouse Builder**



Using Oracle Enterprise Manager

- **Steps**
 - ☐ **Define dimensions objects**
 - ☐ **Define cube objects**
 - ☐ **Build Materialized Views**

Create Cube in OEM



Questions



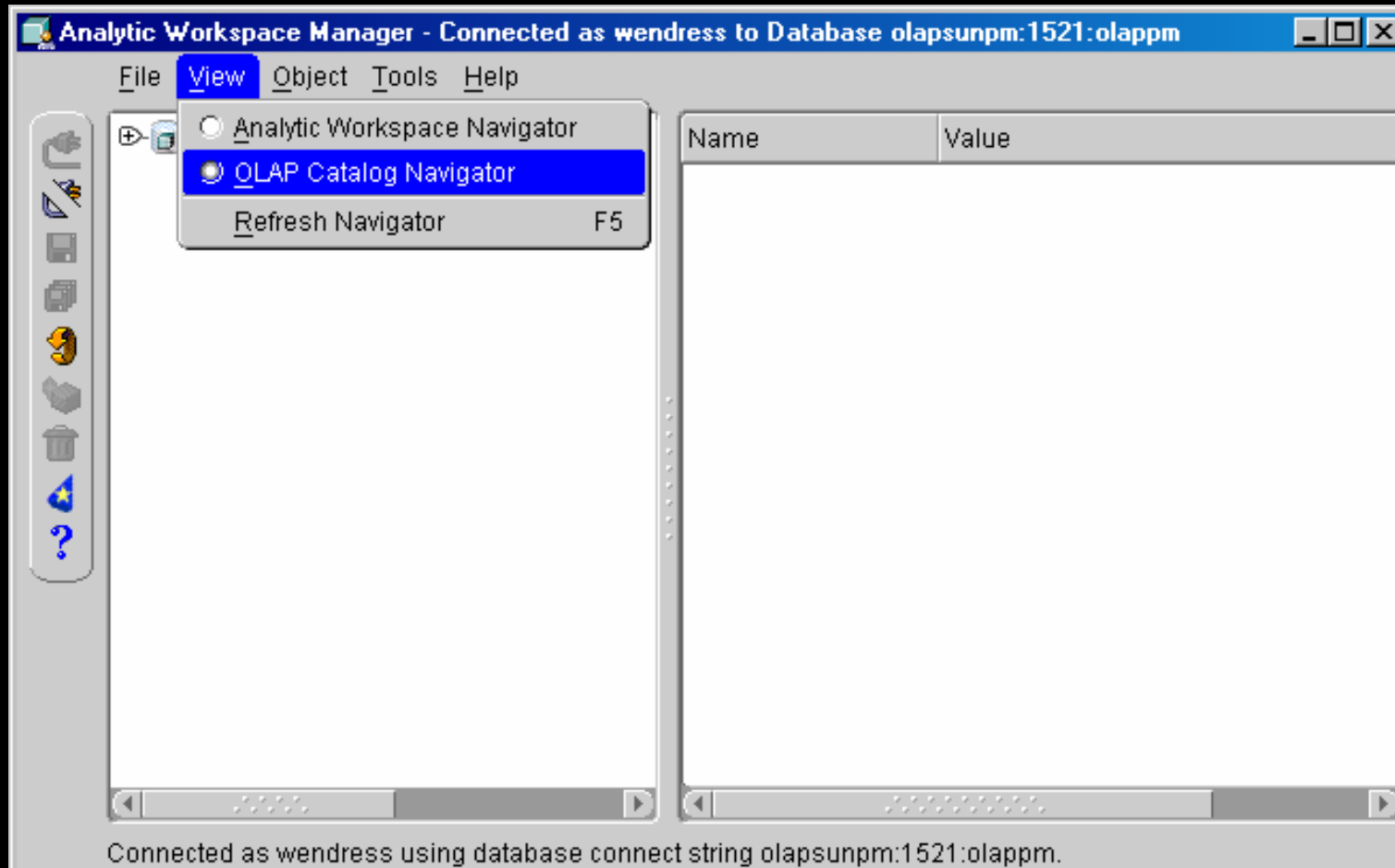


Managing Analytic Workspaces

- **Methods of creating**
 - ☐ **OLAP DML commands**
 - ☐ **cwm2_olap_aw_create package**
 - ☐ **Analytic Workspace Manager**
 - ☐ **Oracle Warehouse Builder**



Analytic Workspace Manager





Analytic Workspace Manager

Analytic Workspace Manager - Connected as jarosdm to Database

File View Object Tools Help

OLAP Catalog

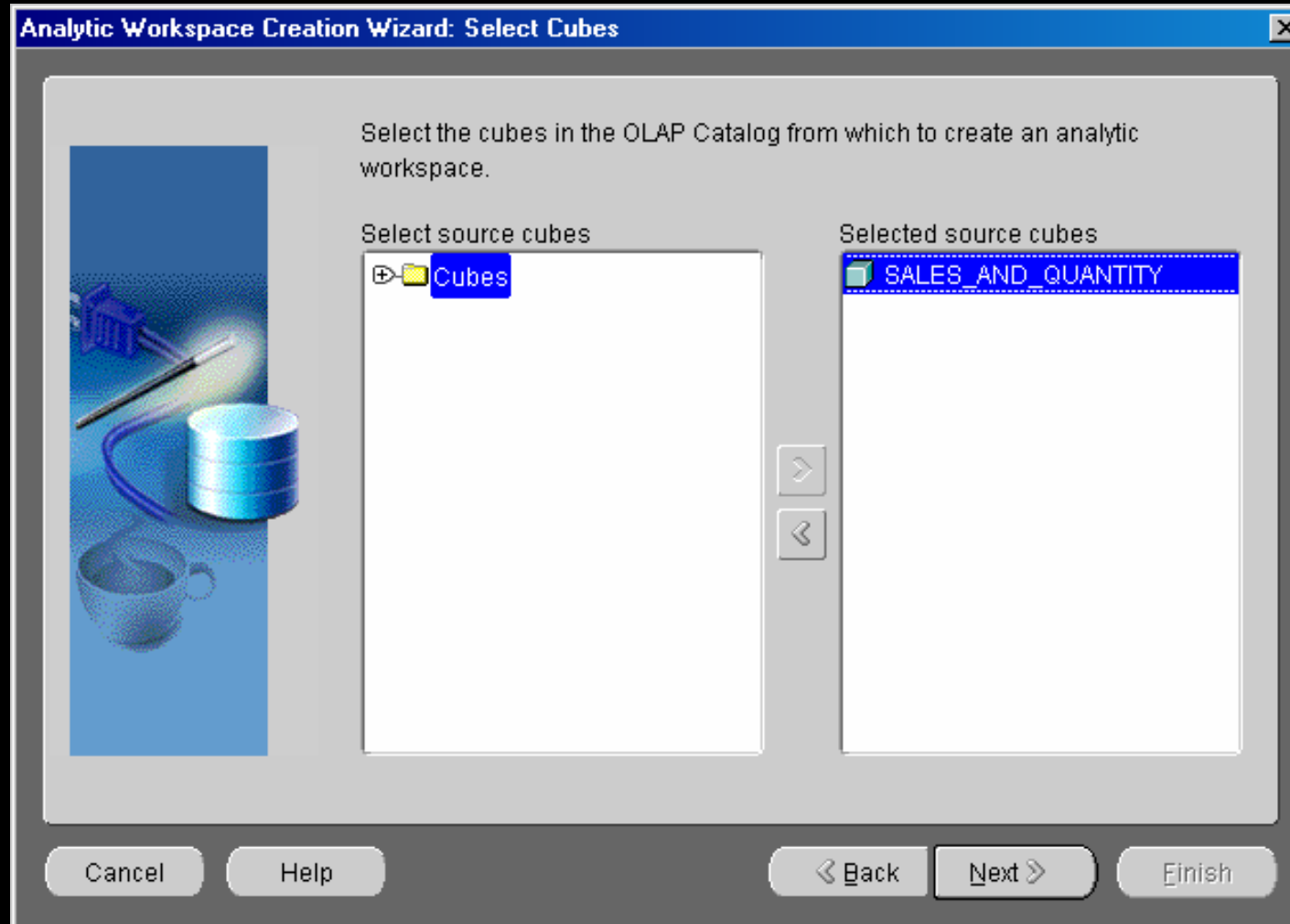
- Measure Folders
- Cubes
 - AWDEMO
 - BIBDEMO
 - JAROSDM
 - Analytic Workspaces
 - Relational Cubes
 - AW_SALES
 - SALES
 - Find...
 - Analytic Workspace Creation Wizard...
 - Dir
 - PRODUCTS
 - TIME
 - WAREHOUSE
 - Measures
 - CANCELLED
 - FORECASTED_SALES
 - INVOICED
 - INVOICED_AMOUNT
 - ORDERED

Name	Value
Description	null
Display Name	SALES
Name	SALES
Owner	JAROSDM
Type	Cube

Connected as jarosdm using database connect string .



Analytic Workspace Manager





Analytic Workspace Manager

Analytic Workspace Creation Wizard: Specify Analytic Workspace

Enter the name of the new analytic workspace to be created

Name: RETAIL_SALES

Tablespace: WENDRES2_DATA

Cancel Help < Back Next > Finish




Analytic Workspace Manager

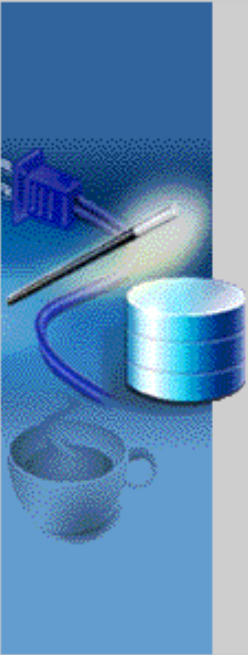
Analytic Workspace Creation Wizard: Enable Workspace for OLAP API & BI Beans

The analytic workspace can be enabled for OLAP API & BI Beans. You can enable the workspace immediately, and/or you can create a SQL script that enabled the workspace when you run the script at a later time.

☒ Enable the workspace for OLAP API & BI Beans immediately

☒ Create a script to enable the workspace for OLAP API and BI Beans

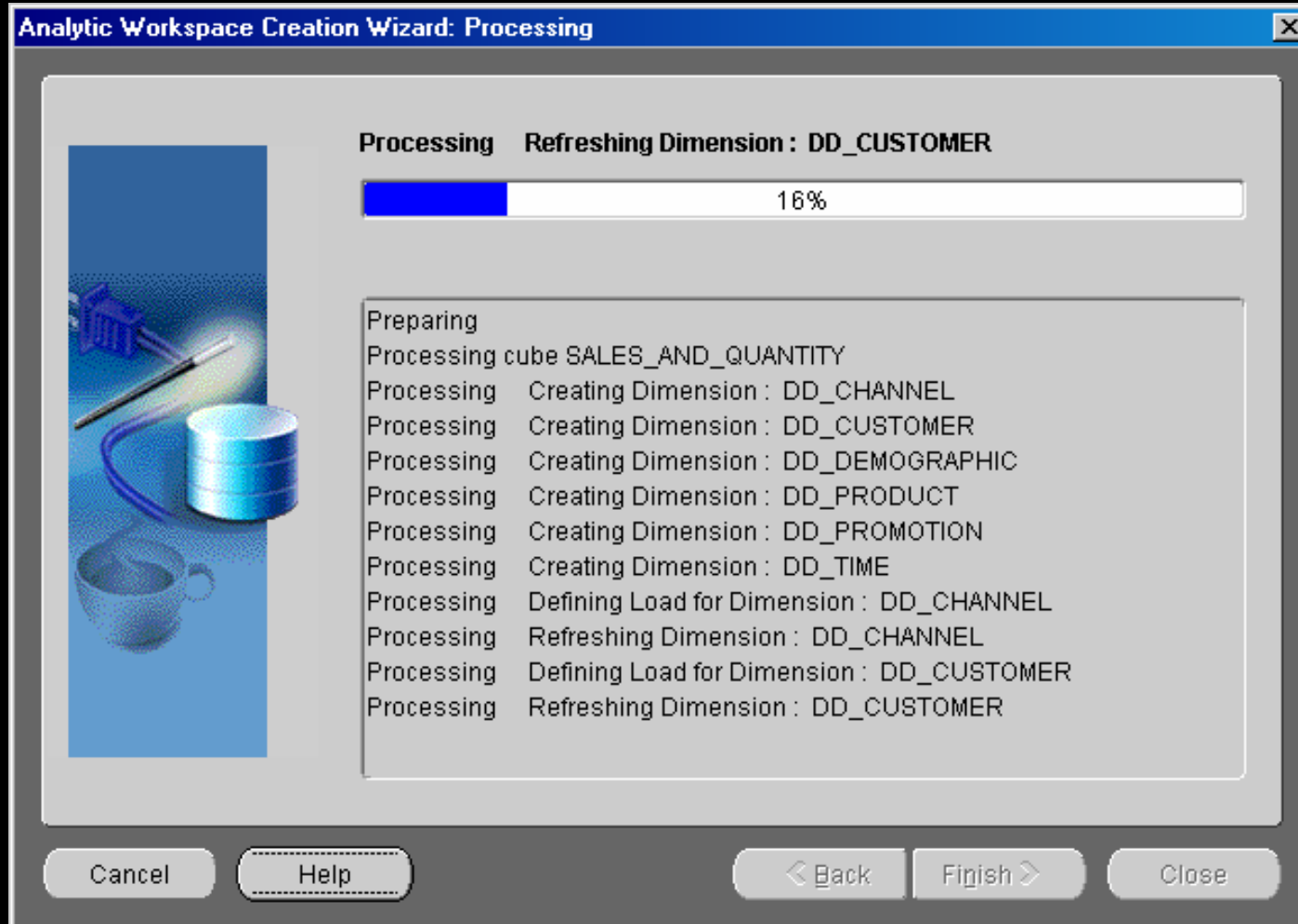
Specify local filename 



Cancel Help < Back Next > Finish



Analytic Workspace Manager



AW Manager Demo





Summary

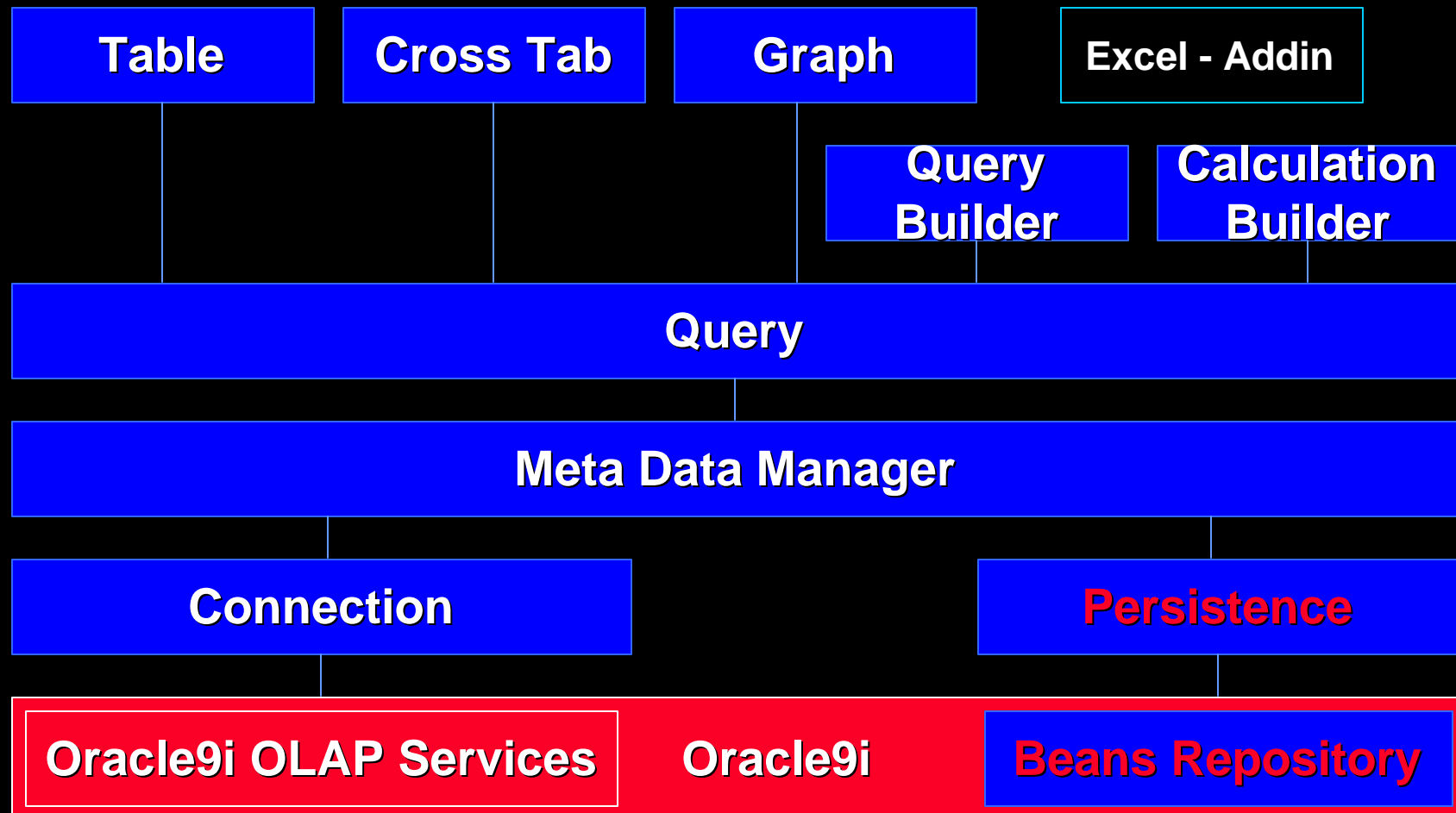
- **Analysis ready relational database**
 - ❑ Analytical functions
 - ❑ Scaleable, manageable
- **Internet application deployment**
 - ❑ Java OLAP API
 - ❑ Business Intelligence Beans and JDeveloper
- **Open**
 - ❑ Java and CWM-compliant meta data
 - ❑ OLAP API and SQL access

Questions?



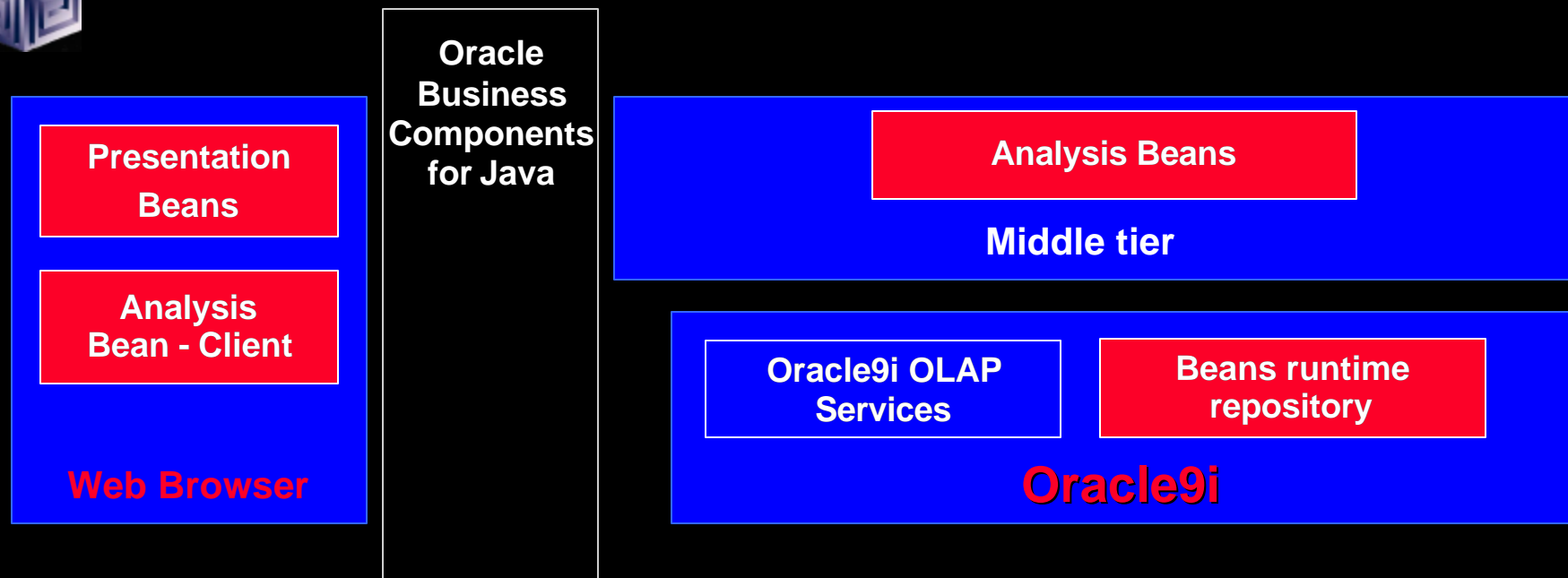


Business Intelligence Beans





Architecture: Java clients

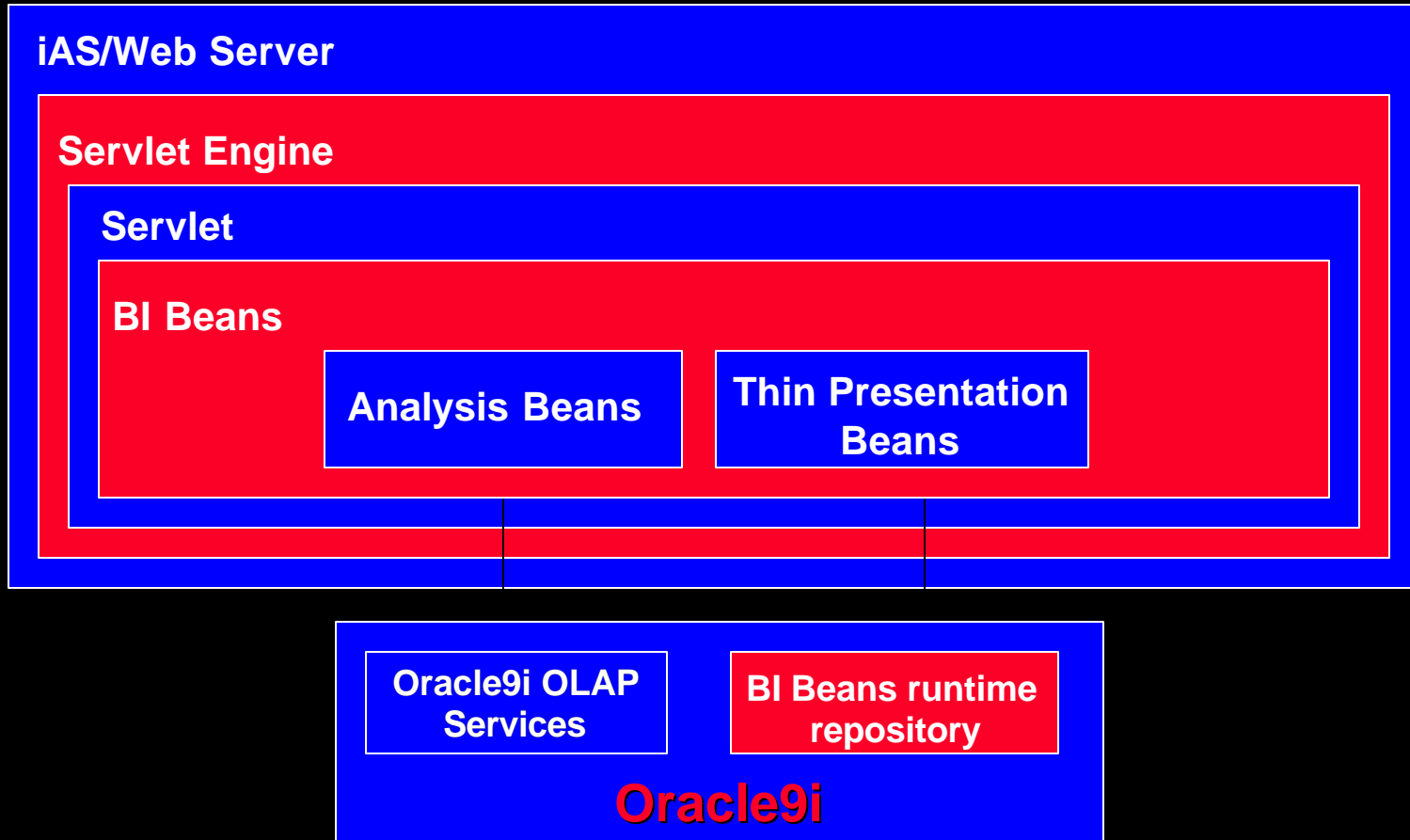


BI Beans use of Oracle Business Components for Java:

- * communications protocol across tiers
- * deploying iBeans on the middle tier (EJB, 8i)
- * insulates application developer from “application plumbing” related to deployment



Architecture: Thin client





-
- The screenshot shows the Oracle JDeveloper IDE interface. The title bar indicates the project is 'BIAnalyst1.jar'. The menu bar includes File, Edit, Search, View, Project, Run, Debug, Model, Tools, Window, and Help. The toolbar contains various icons for file operations and development tools. The 'System - Navigator' on the left shows the project structure, including 'myPackage', 'imports', and sub-packages like 'BIAboutDialog', 'BIAboutDialogFrame', 'i18n', and 'iPackageLoadedString'. The main editor window displays the 'AboutDialog.java' file with the following code:
- ```

117 _middlePanel.setLayout(new GridLayout(2, 1, 10, 10));
118
119 // Create a table with the version number for every package
120 JTable _table = new JTable(new PackagesModel());
121 JScrollPane scrollPane1 = new JScrollPane(_table);
122 _middlePanel.add(scrollPane1);
123
124 // Create a table with detailed information for a selected package
125 final JTable _table2 = new JTable(new PackageModel(s_packages[0]));
126 JScrollPane scrollPane2 = new JScrollPane(_table2);
127 _middlePanel.add(scrollPane2);
128
129 // Add a listener to the summary packages, that waits for a user to
130 // a package
131 UserSelectionModel _model = _table.getUserSelectionModel();

```
- The bottom console shows log messages and the command 'Starting BIAnalyst1.jar'.

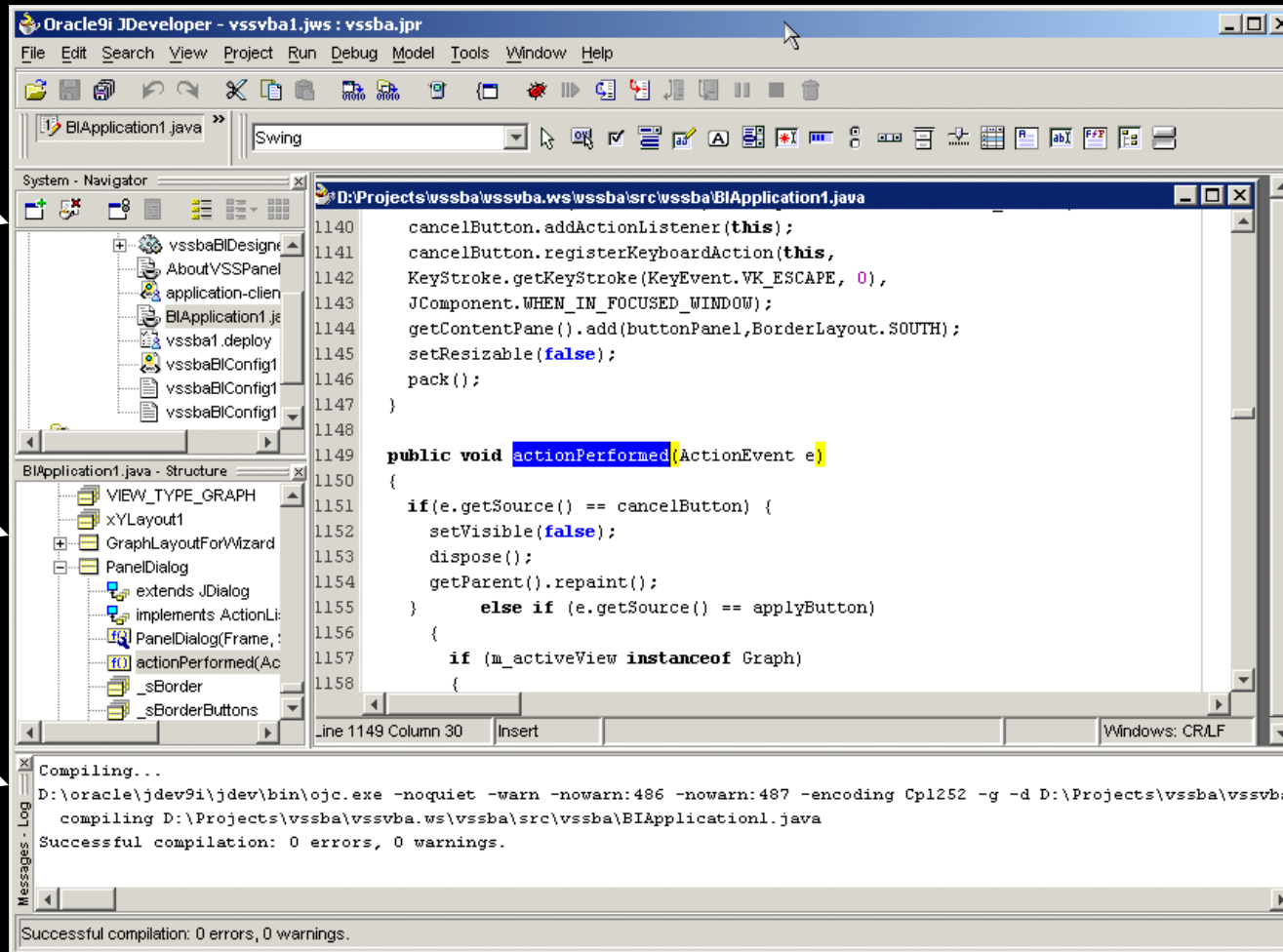


# JDeveloper 9i Environment

System  
Navigator

Structure  
Window

Log  
Window



Component  
Toolbar

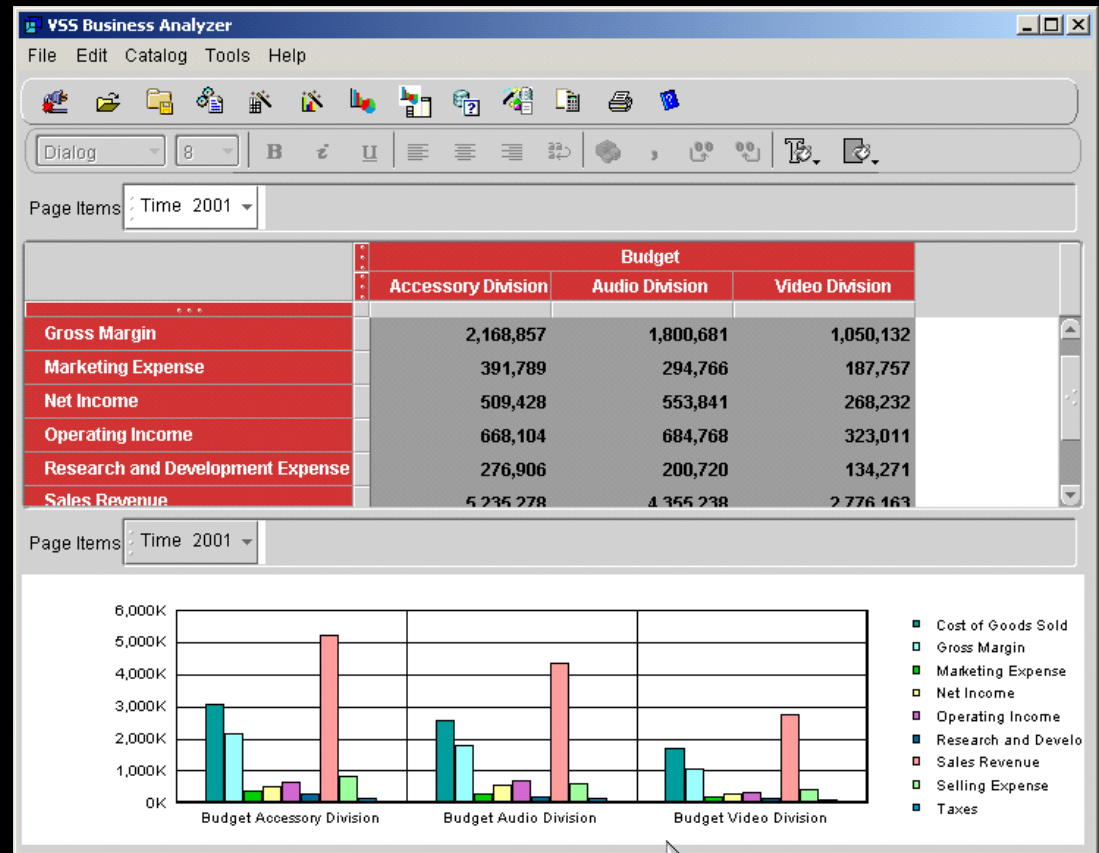
Code  
Window





# What Can We Really Do?

- **VSS Business Analyzer is an example of what can be done**
- **Developed in less than 4 months!**
- **Comprehensive Application that provides Ad-Hoc Query capabilities in both Thick and thin clients**
- **Utilizes a central report catalog available to all client types**
- **Provides an extensible framework for more complex applications**



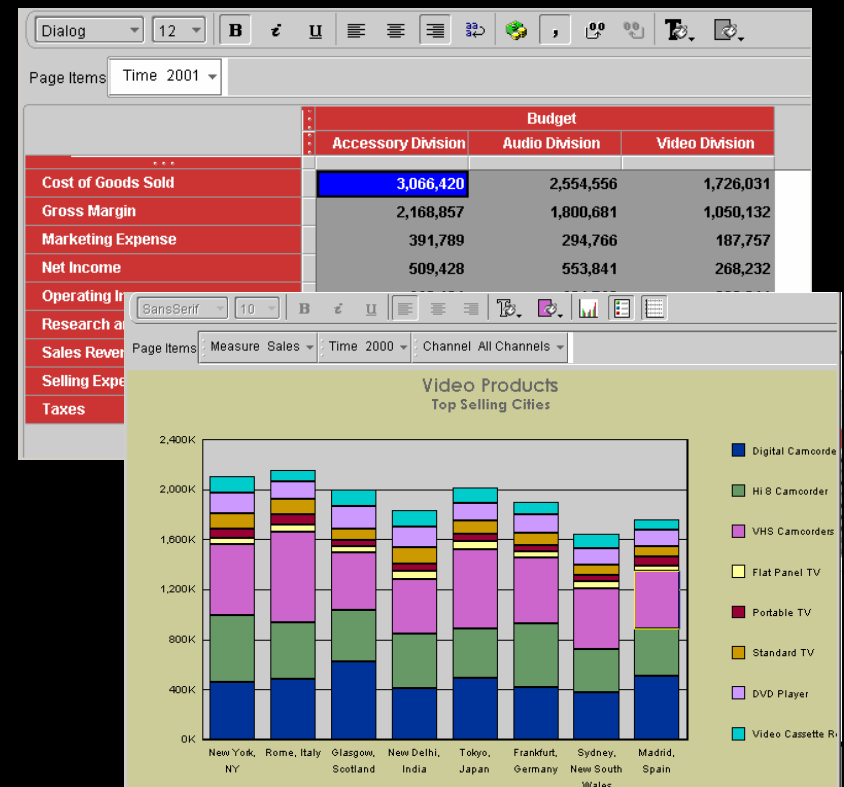
See [www.vlamis.com](http://www.vlamis.com) for more info...



# Presentation Beans

- Provides common user interface across Oracle BI products
- Translate UI gestures into OLAP events
- Graph
  - ☐ Over 50 graph types supported
  - ☐ Customizers for modifying appearance
- Crosstab/Table
  - ☐ Cell level formatting
- View toolbar enables simple access to formatting capabilities
- Customers: Discoverer, Reports, Portal, CRM, Enterprise Planning and Budgeting, Balanced Scorecard

...



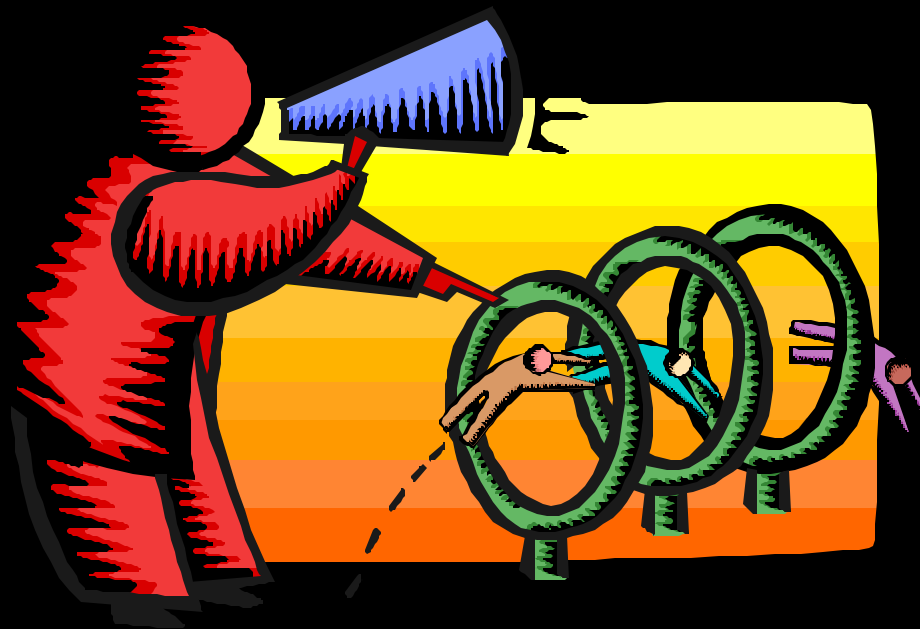
# Programming with BI Beans Java Samples



- **BI Beans includes Java Client Samples:**
  - ☐ **Creating and Formatting Graphs**
  - ☐ **Using the BI Beans Catalog**
  - ☐ **Using Rules to Format Crosstabs**
  - ☐ **Printing Crosstabs**
  - ☐ **Creating Calculations**
  - ☐ **Using QueryBuilder Capabilities**
  - ☐ **Linking Presentations**
  - ☐ **Viewing Metadata**



# Demonstrations





# Business Intelligence Wizards

- **Specialized Wizards Built into JDeveloper 9i**
  - ☐ **Connection Wizard**
  - ☐ **Calculation Wizard**
  - ☐ **Query Wizard**
  - ☐ **Presentation Wizard**
  - ☐ **Java Client Application Wizard**
  - ☐ **Servlet (JSP) Application Wizard**

# BI Beans Designer Settings

The BI Beans Settings dialog box is shown with two tabs: 'Design Settings - Project1BIDesigner1' and 'Run Settings - Project1BIConfig1'. The 'Design Settings' tab is active. It contains a section for 'Data Source' with a text box for 'OLAP Connection' set to 'OLAPConnection1' and buttons for 'New...', 'Edit...', and 'Test'. Below this is a 'Catalog' section with a text box for 'Directory' set to '3ITutorial\Project1\src\bidefs\Project1BIDesigner1' and a 'Browse...' button. At the bottom are 'Help', 'OK', and 'Cancel' buttons.

BI Beans Settings

Design Settings - Project1BIDesigner1 | Run Settings - Project1BIConfig1

Specify your design settings. These settings are used when creating data-aware Business Intelligence objects in JDeveloper.

Data Source

Select the OLAP data source that you want to work with:

OLAP Connection: OLAPConnection1

New... Edit... Test

Catalog

Specify a directory for storing Business Intelligence objects when developing your application in JDeveloper. You can copy these objects to a Catalog in an Oracle database when deploying your application.

Directory: 3ITutorial\Project1\src\bidefs\Project1BIDesigner1

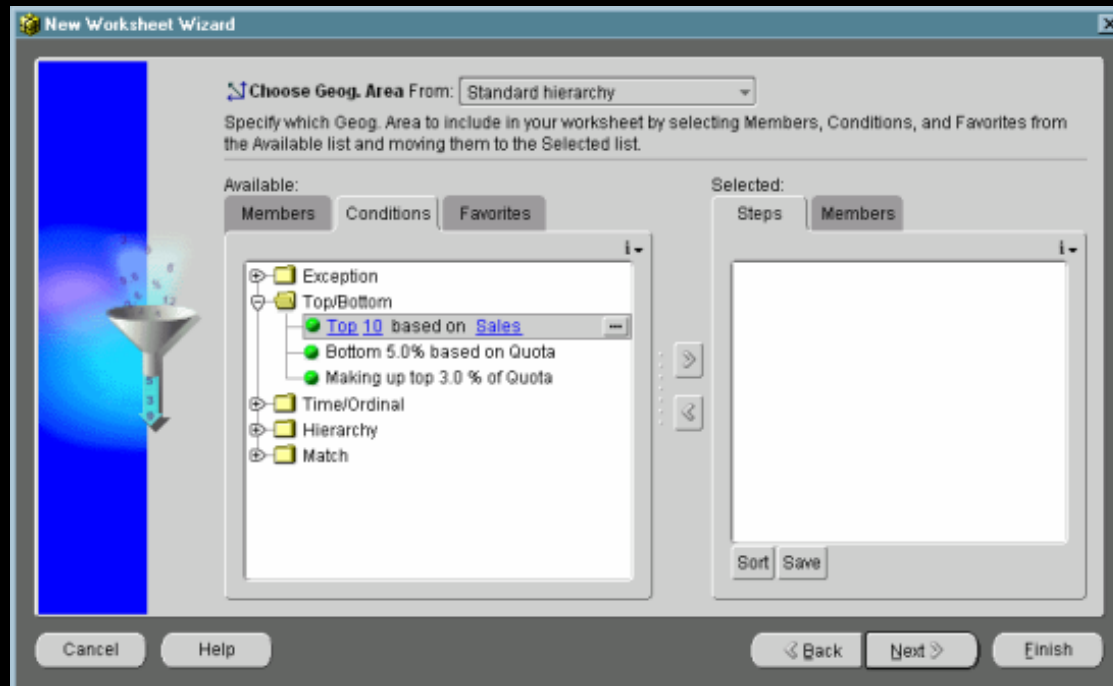
Browse...

Help OK Cancel

- **Container for Business Intelligence Objects**
- **References information needed to connect:**
  - ☐ **to Oracle 9i OLAP**
  - ☐ **and the BI Beans Catalog.**
- **Design Settings - Lets you view and edit settings in your BI Designer object**
- **Run Settings - Lets you view and edit settings in your BI Configuration file**



# Query Builder



- “Brains” behind the presentation beans
  - ☐ Data provider
  - ☐ Data navigation
  - ☐ Data selection
- QueryBuilder customizer
  - ☐ Enables end user to specify advanced queries using business terms - not SQL
  - ☐ Save favorite selections
- CalcBuilder
  - ☐ Wizard enables creation of new calculations, including: variances, ratios, time comparisons, and more


# Customizer




**Crosstab Customizer - Step 1 of 3: Options**

Options | Titles | Format | Style

Select options for your crosstab.

☒ Show horizontal grid lines: 

☒ Show vertical grid lines: 

☐ 3D gridlines

☒ Show column headers

☒ Show row headers

Row header style:

☒ Inline

☐ Outline

Sample:

|           | Quarter 1 | Quarter 2 | Quarter 3 | Quarter 4 |
|-----------|-----------|-----------|-----------|-----------|
| Product A |           |           |           |           |
| Product B |           |           |           |           |
| Product C |           |           |           |           |
| Product D |           |           |           |           |
| Product E |           |           |           |           |

[Help](#) [Apply](#)

- Alter the look of your presentation.
- Add titles and footnotes.

**Crosstab Customizer - Step 2 of 3: Titles**

Options | Titles | Format | Style

Enter text for your crosstab titles.

☒ Show Title [Insert](#) [Title Font...](#)

Asian Sales Summary

☒ Show Subtitle [Insert](#) [Subtitle Font...](#)

Stoplight Report

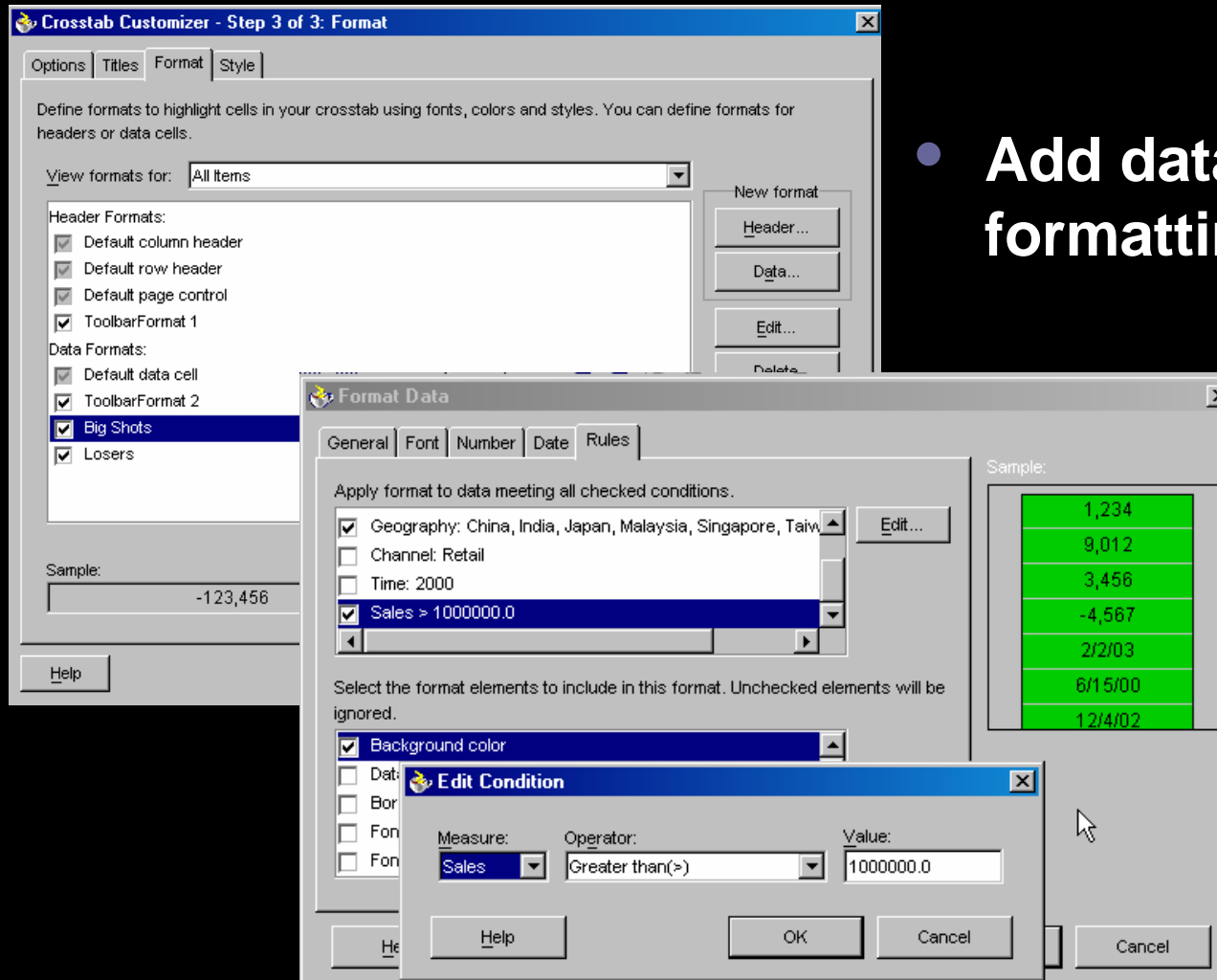
☐ Show Footnote [Insert](#) [Footnote Font...](#)





# Customizer

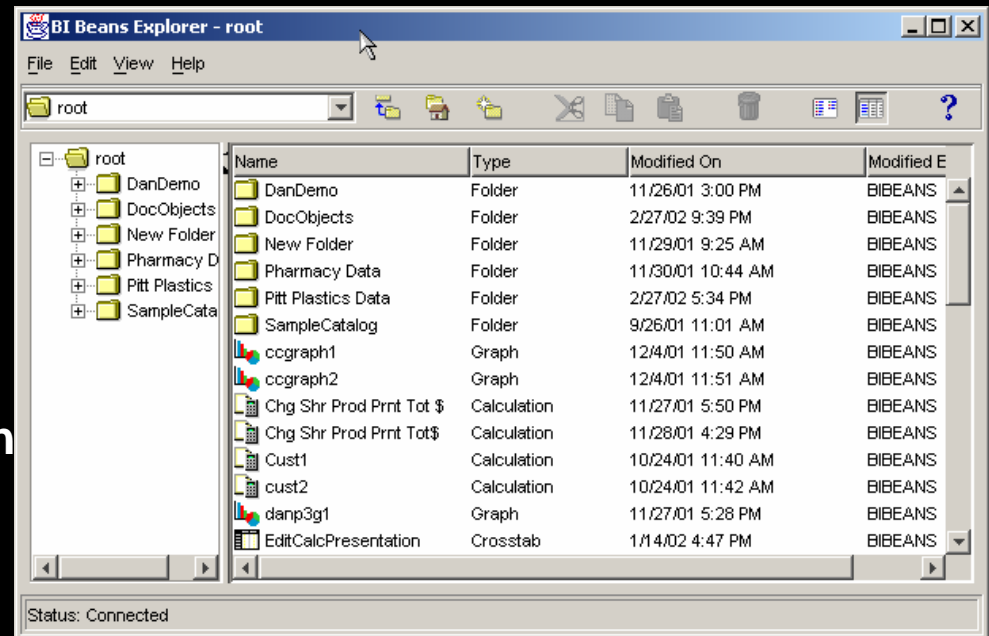
- Add data-driven formatting.





# Persistence Services – BI Catalog

- Enables end users to save personal analyses or share analyses with other users.
- Organizes information in folders
- Persisted objects include:
  - ☐ Crosstab, table and graph formatting
  - ☐ Entire queries or individual selections
  - ☐ Calculations
- Objects persisted in XML format
- Searchable





# Summary

- **Analysis ready relational database**
  - ❑ **Analytical functions**
  - ❑ **Scaleable, manageable**
- **Internet application deployment**
  - ❑ **Java OLAP API**
  - ❑ **Business Intelligence Beans and JDeveloper**
- **Open**
  - ❑ **Java and CWM-compliant meta data**
  - ❑ **OLAP API and SQL access**



## How Get Started? / More Information

- **Oracle Warehouse Builder**
  - ❑ Download from OTN, Tutorials and Training
- **Java programming**
  - ❑ Start with JDeveloper 9i (download from OTN)
- **BI Beans**
  - ❑ Tutorials (In JDeveloper)
  - ❑ Samples (on OTN)
  - ❑ Training (Web and Instructor Led)
- **Discussion Forums**
  - ❑ <http://www.oracle.com/forums/forum.jsp?id=828024>
- **VSS Business Analyzer**
  - ❑ [www.vlamis.com](http://www.vlamis.com)

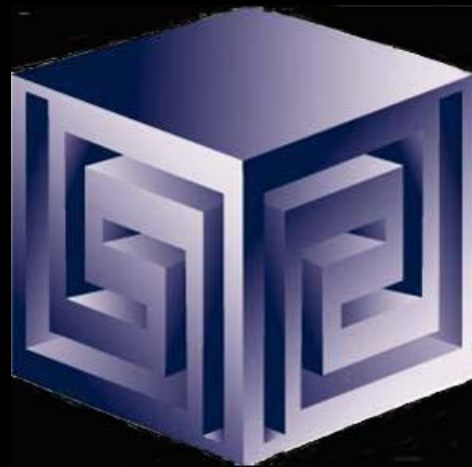


# Q & A



# An End-to-End Solution Using OWB and JDeveloper to Analyze Your Data Warehouse

Presented at ODTUG 2003



Dan Vlamis

[dvlamis@vlamis.com](mailto:dvlamis@vlamis.com)

Vlamis Software Solutions, Inc.

(816) 781-2880

<http://www.vlamis.com>

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