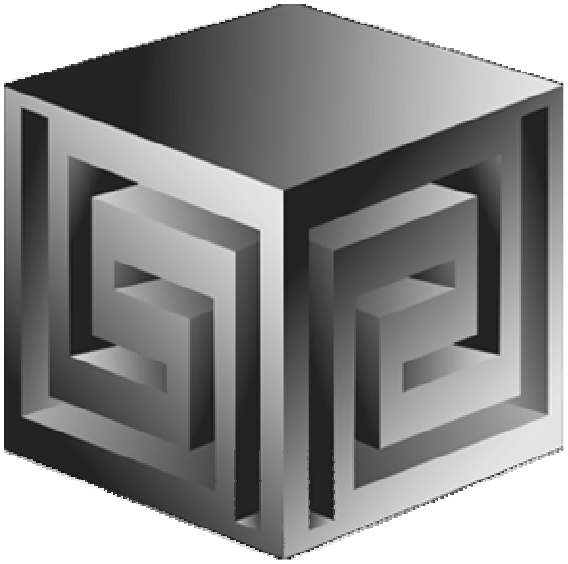
Using Oracle Business Intelligence Tools to Analyze Data Warehouses.ppt

presented at
Ohio Oracle User Group
July, 2004



Presented by:

Dan Vlamis (dvlamis@vlamis.com)

Vlamis Software Solutions, Inc.
(816) 781-2880

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Vlamis Software Solutions, Inc.

- Founded in 1992 in Kansas City, Missouri
- 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.

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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

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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

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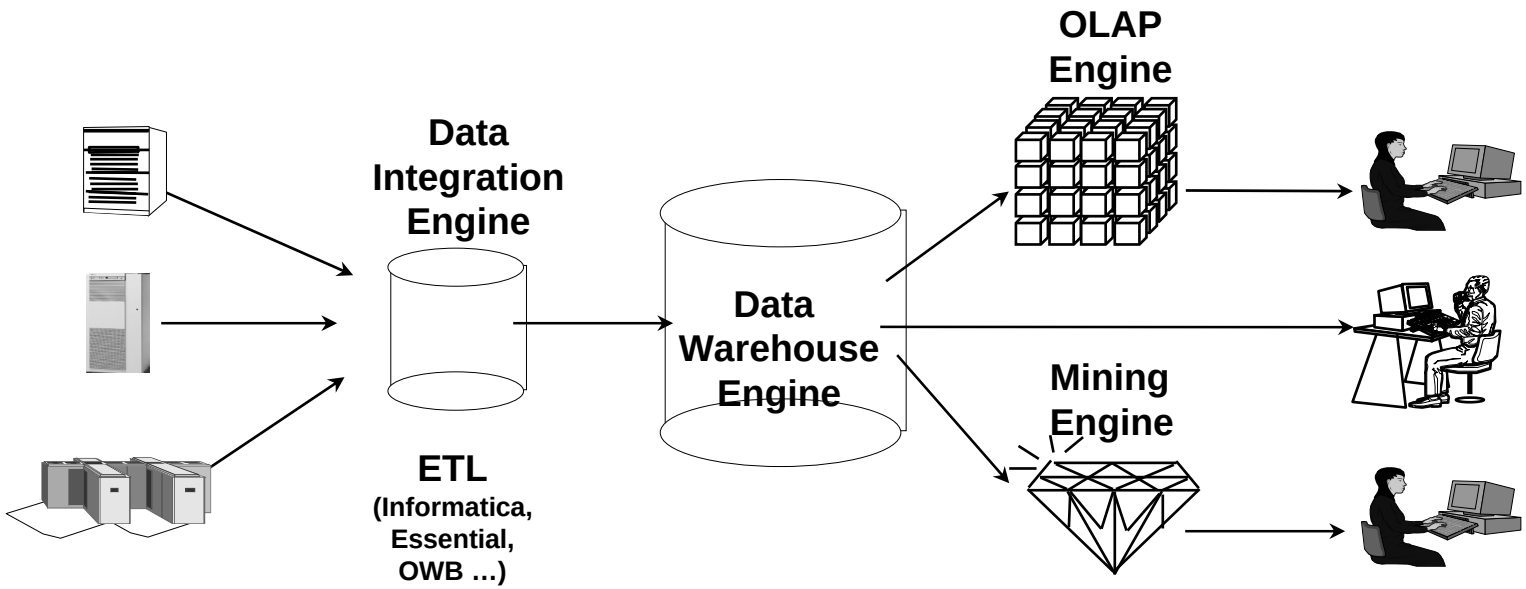
Business Intelligence the Old Way



- Special purpose engines for differing tasks
  - Metadata migration tools ease replication
  - User interfaces generally different for different tools

Thin Client Demo

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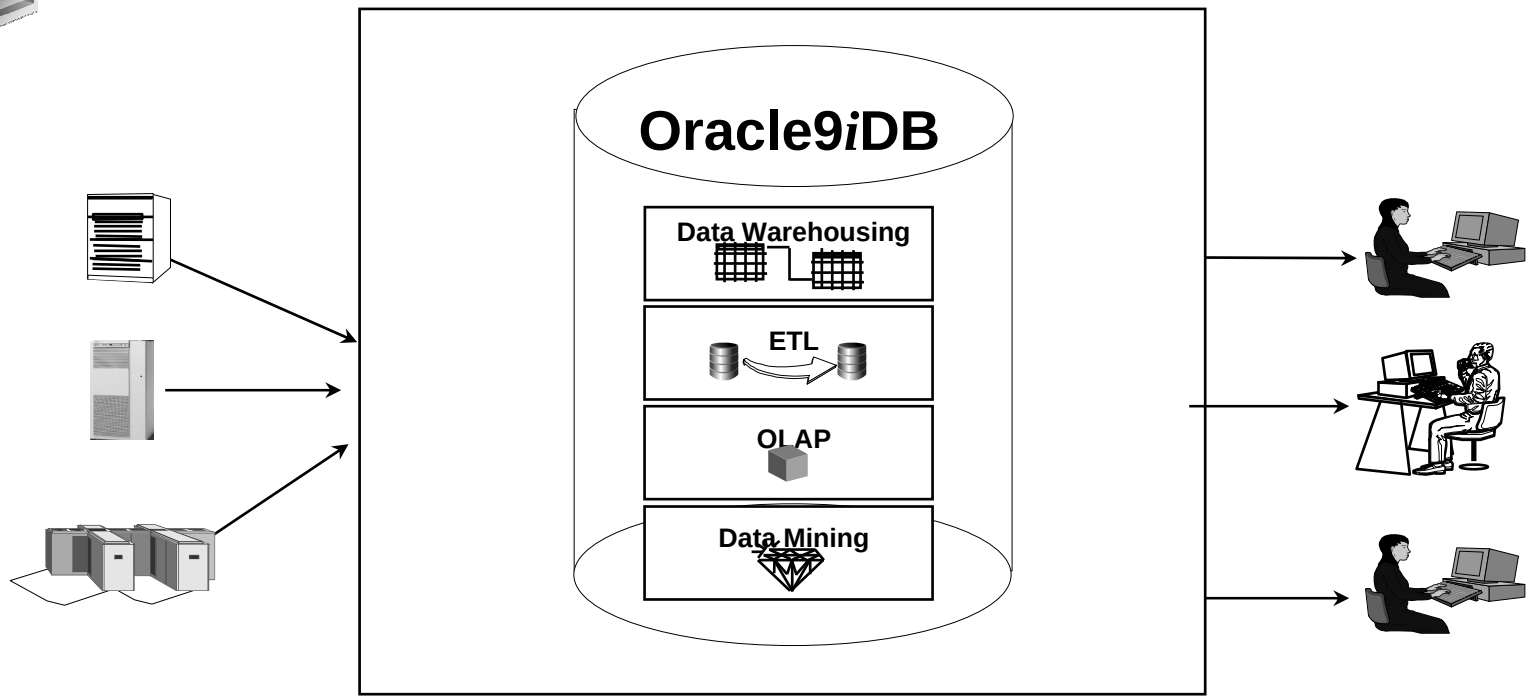
BI the New Way: Oracle 9iDB



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

Thin Client Demo

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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

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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

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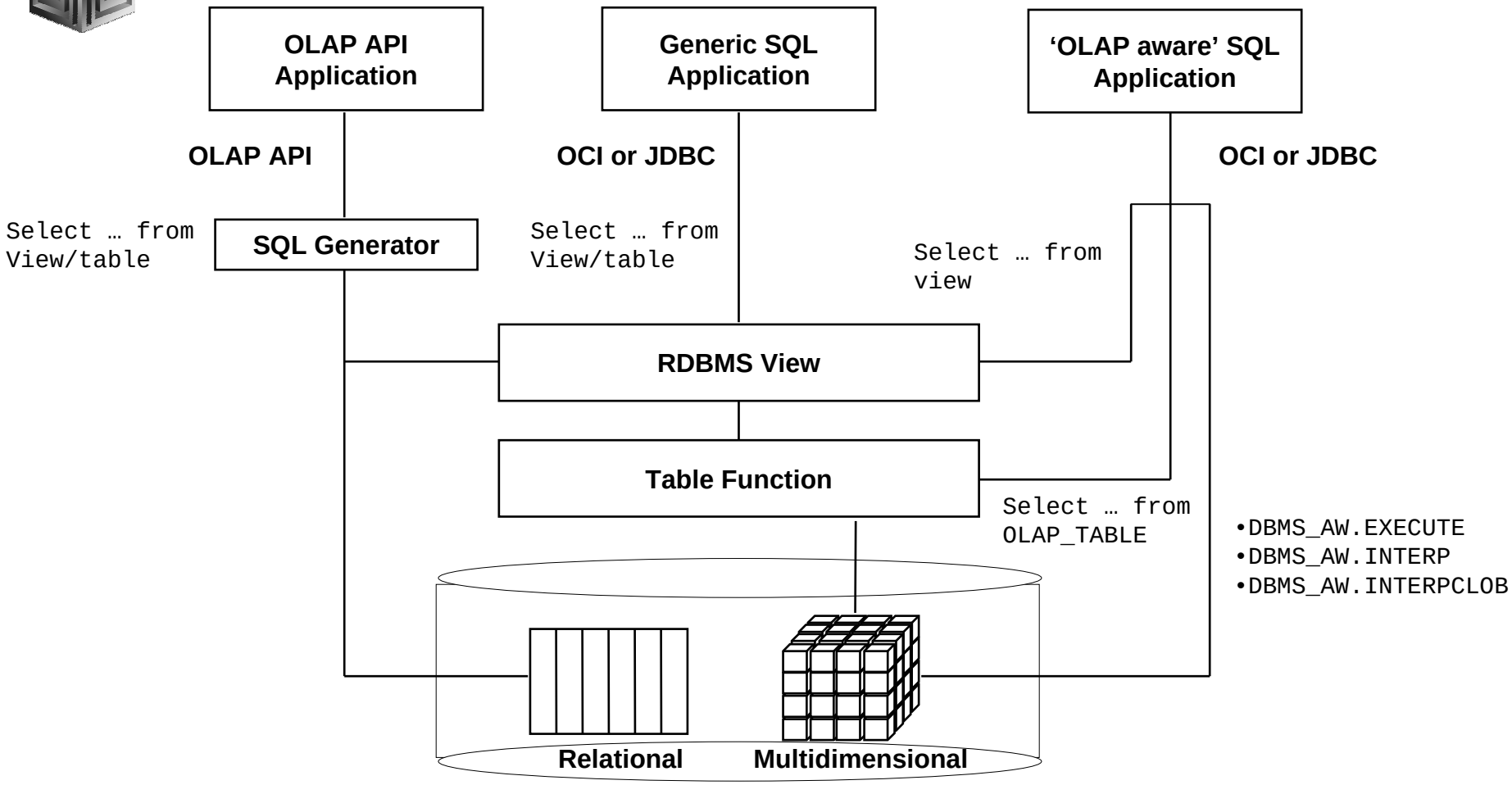
Query Methods



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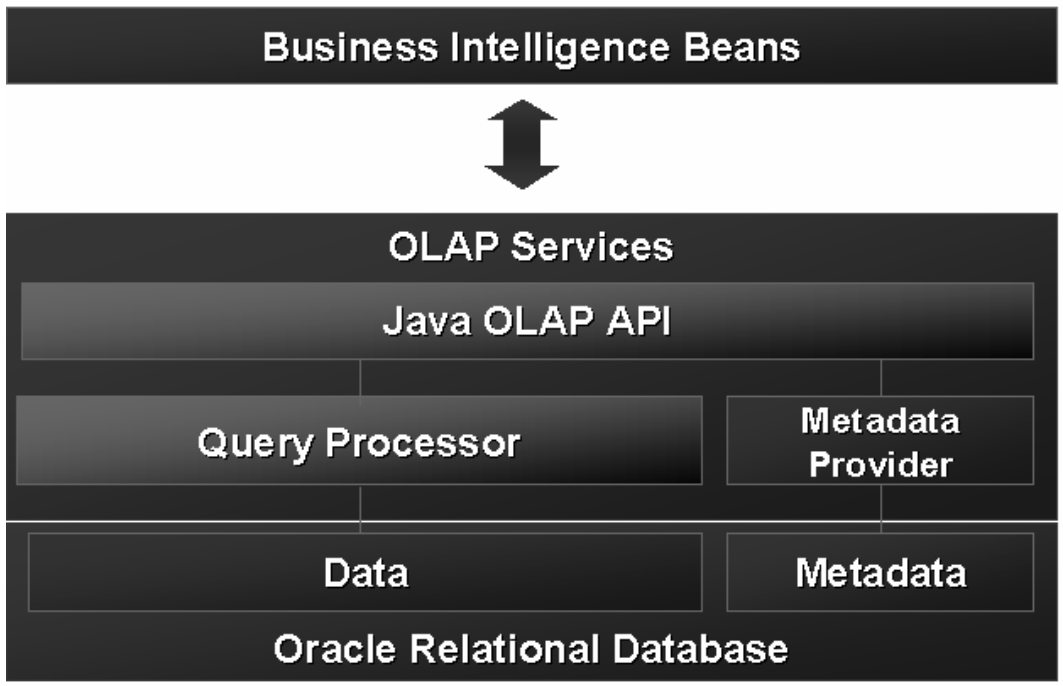
Oracle 9i OLAP Architecture



Rapid application development
Analysis ready

Java OLAP API
Predictive analysis functions

Scaleable data store
Integrated meta data
Summary management
SQL analytic functions

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Java OLAP API

- Designed for OLAP on the internet
  - Java, object-oriented
  - Supports OLAP calculations
  - Schema independent
- The API for analytical tools and applications
  - Oracle Business Intelligence Beans
  - Oracle Applications

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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 (Summer 2004)

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Questions?

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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

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What is OWB?
Components: Overview

- Components of Oracle Warehouse Builder
  - Repository (CWM)
  - Graphical User Interface
  - Code Generator
  - Integrators
  - OWB Bridge

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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 …)

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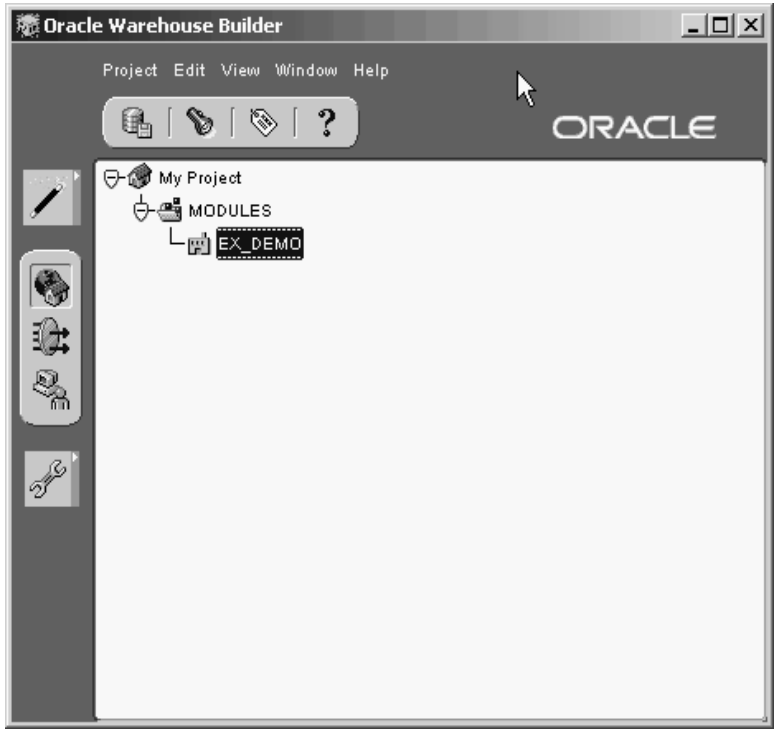
Components: OWB User Interface

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



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Components: Code Generators

- Code Generators are provided for:
  - Transformations
  - DDL
  - SQL Loader scripts
  - User Defined transformations

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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

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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

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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

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The Process in OWB

- Design or Import Relational Schema
  - Define Dimensions
  - Define Cubes (Facts)
  - Define Materialized Views (summary tables)
- Create Physical Schema Script
- Create Script for 9i OLAP
- Run Script(s)
- View in OEM/Cube Builder
- Run Application
- Gather Statistics / Tune

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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

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Metadata Export - Bridge

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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: Oracle9i Warehouse Builder Info

Select the product where you want to transfer the metadata

To: OMG CWM 1.0

- OMG CWM 1.0
- Oracle9i OLAP
- Oracle Express
- Oracle9i Discoverer

Enter a des
(optional)

Description: My Metadata Transfer

Cancel Help Back Next Finish

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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

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

Cancel | Help | Back | Next | Finish

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OLAP Bridge – Transfer Parameters

Oracle Warehouse Builder Transfer Wizard, 3 of 3: Summary

Confirmation of Oracle WB Transfer

From: Oracle9i Warehouse Builder To: Oracle9i OLAP

Description: My Metadata Transfer

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

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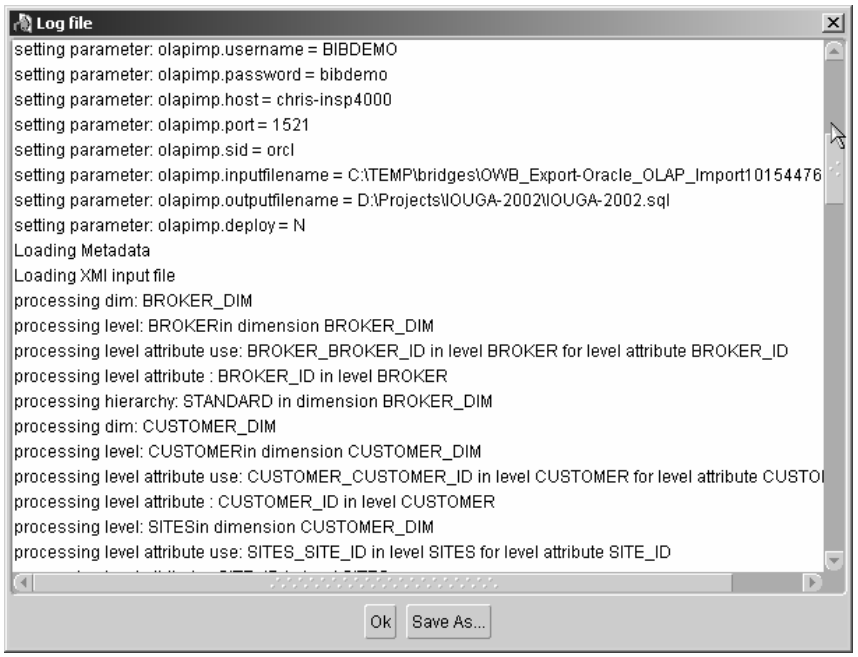
CWM Bridge – Running



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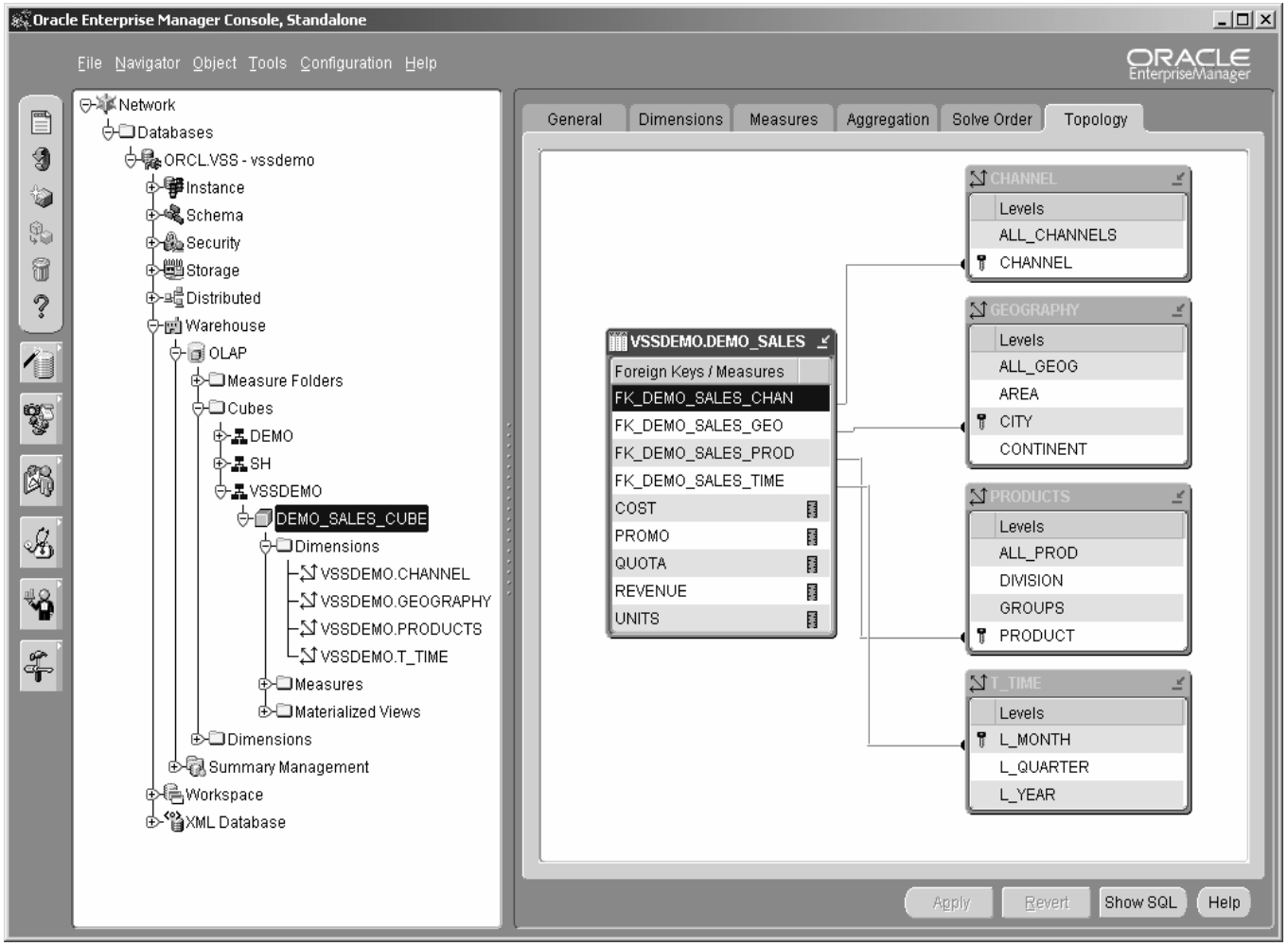
OEM Cube Builder – The Results



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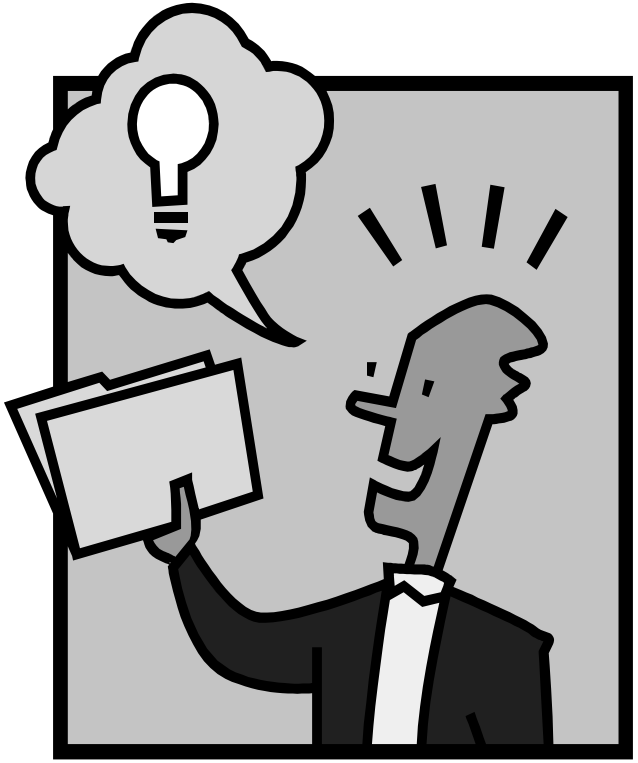

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Relational or Analytic Workspace?

- 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

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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

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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

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Cube Built by OWB

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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

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Defining Relational Cubes

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

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Using Oracle Enterprise Manager

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

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Create Cube in OEM

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Questions

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Managing Analytic Workspaces

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

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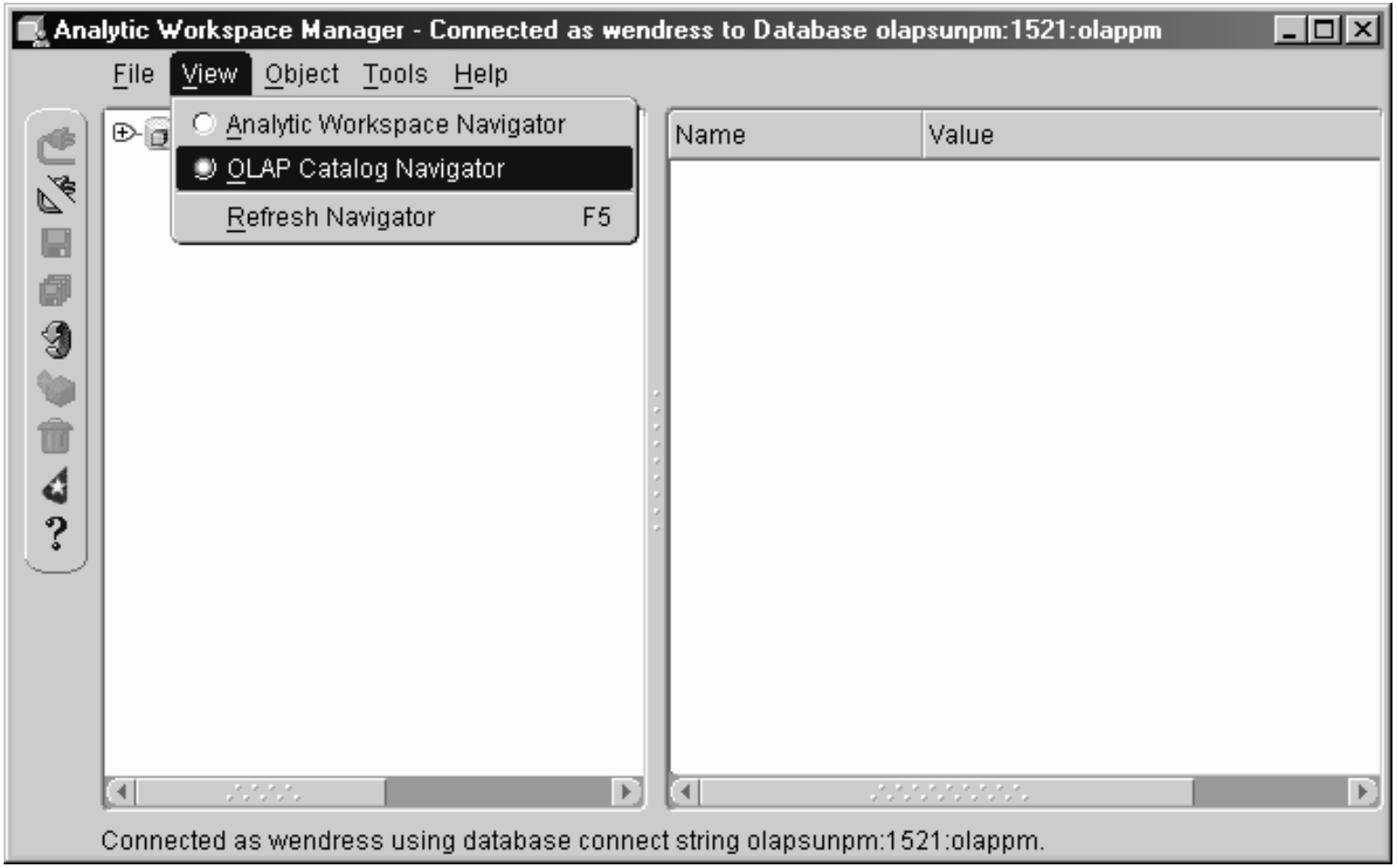
Analytic Workspace Manager



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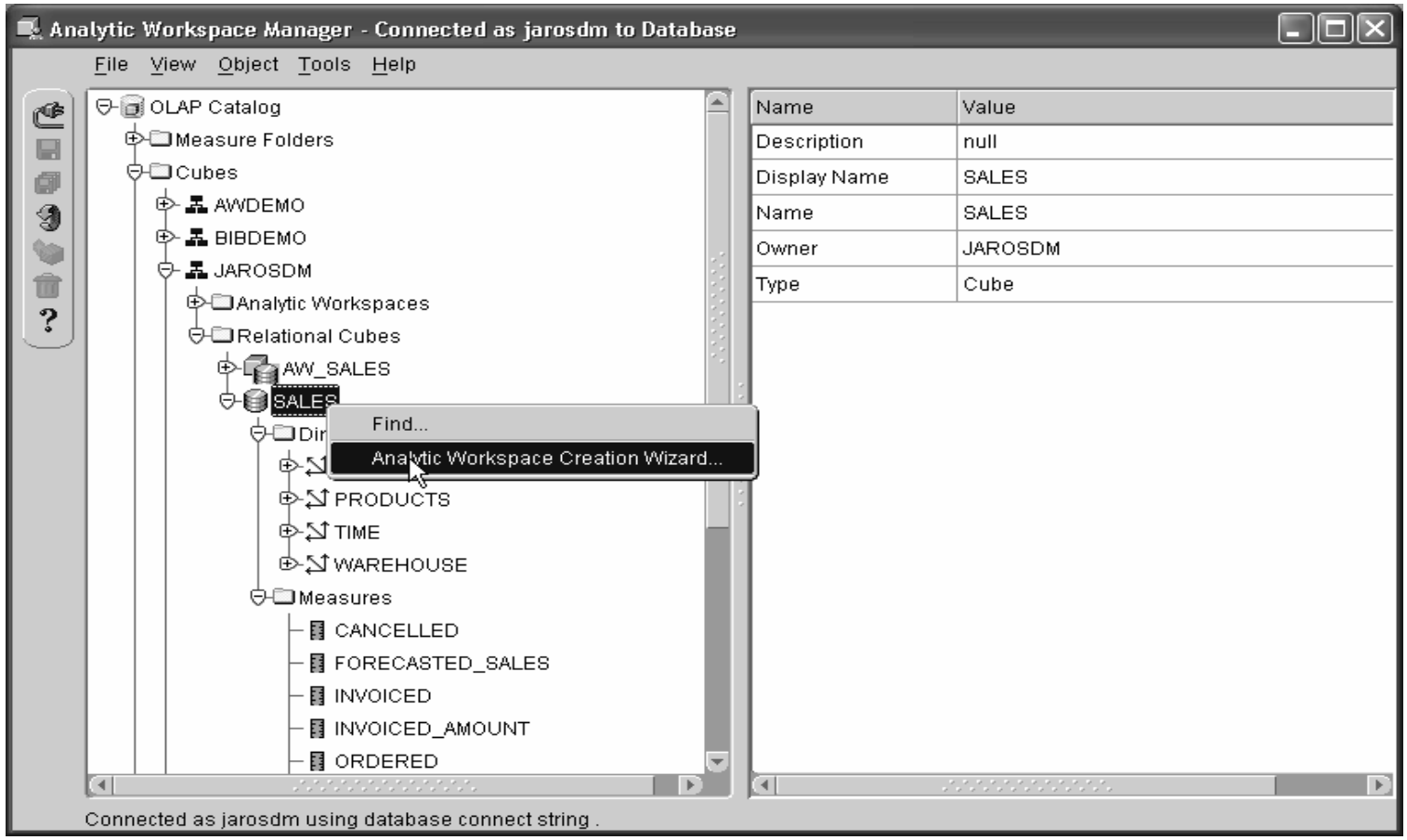
Analytic Workspace Manager



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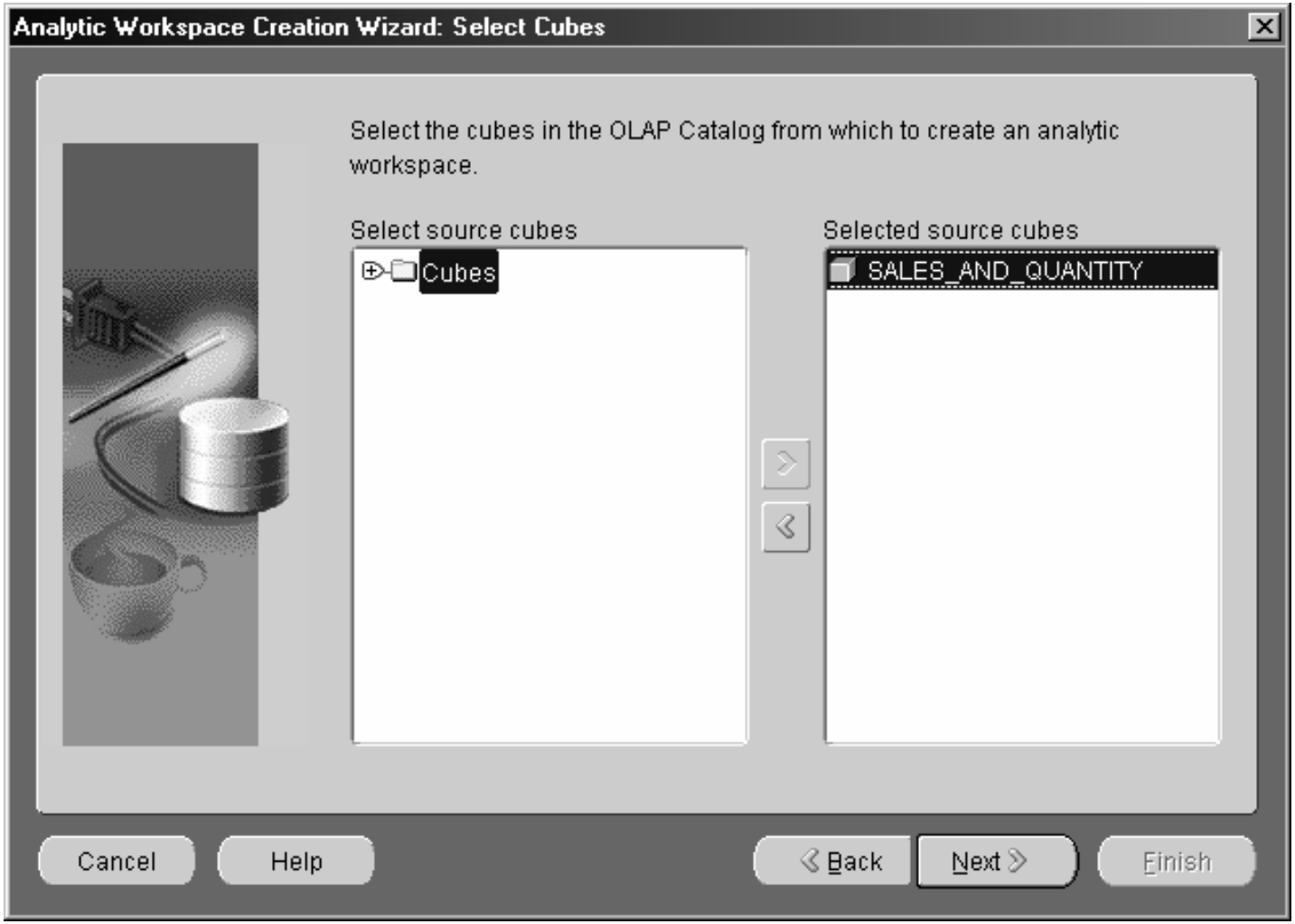
Analytic Workspace Manager



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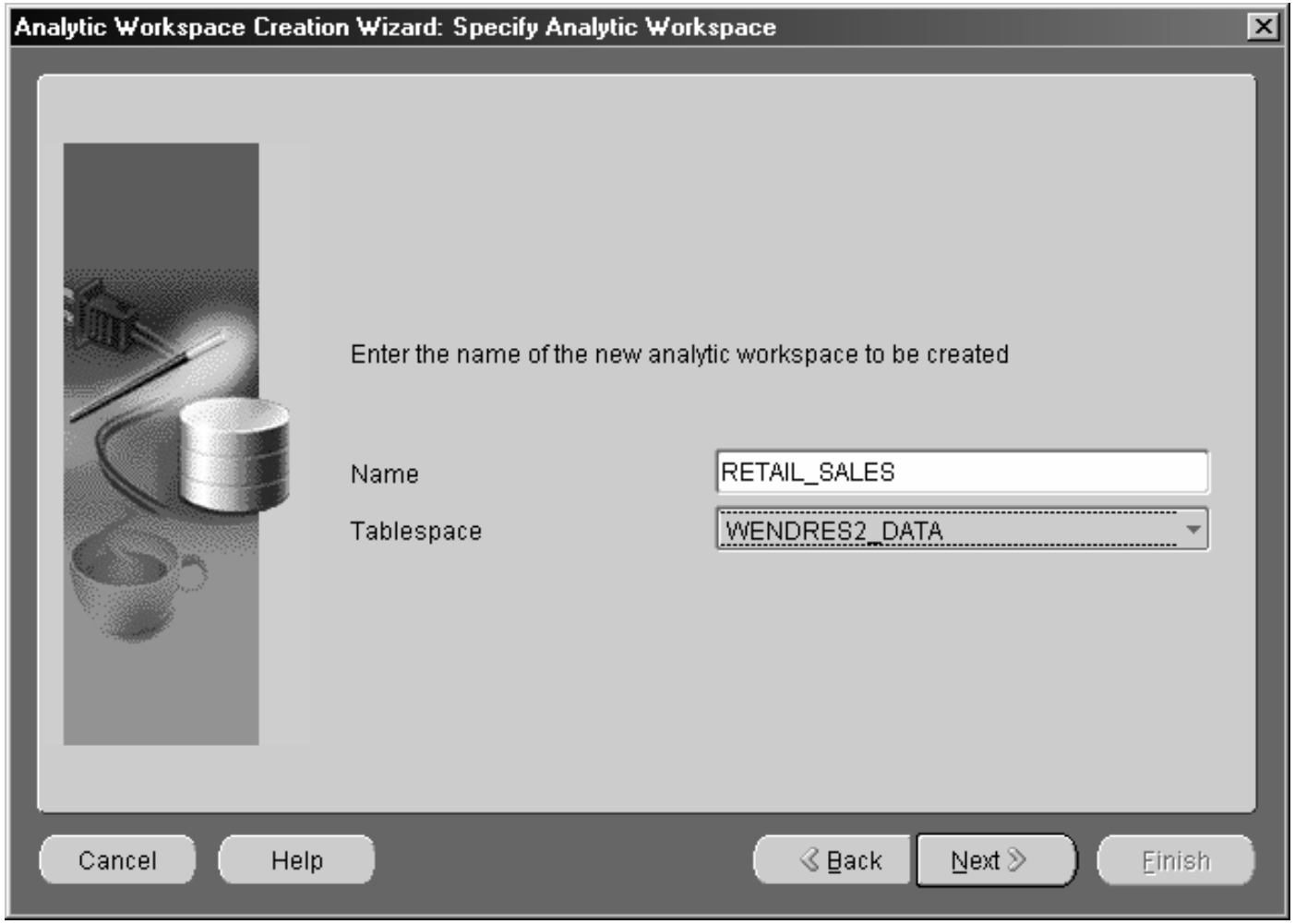
Analytic Workspace Manager



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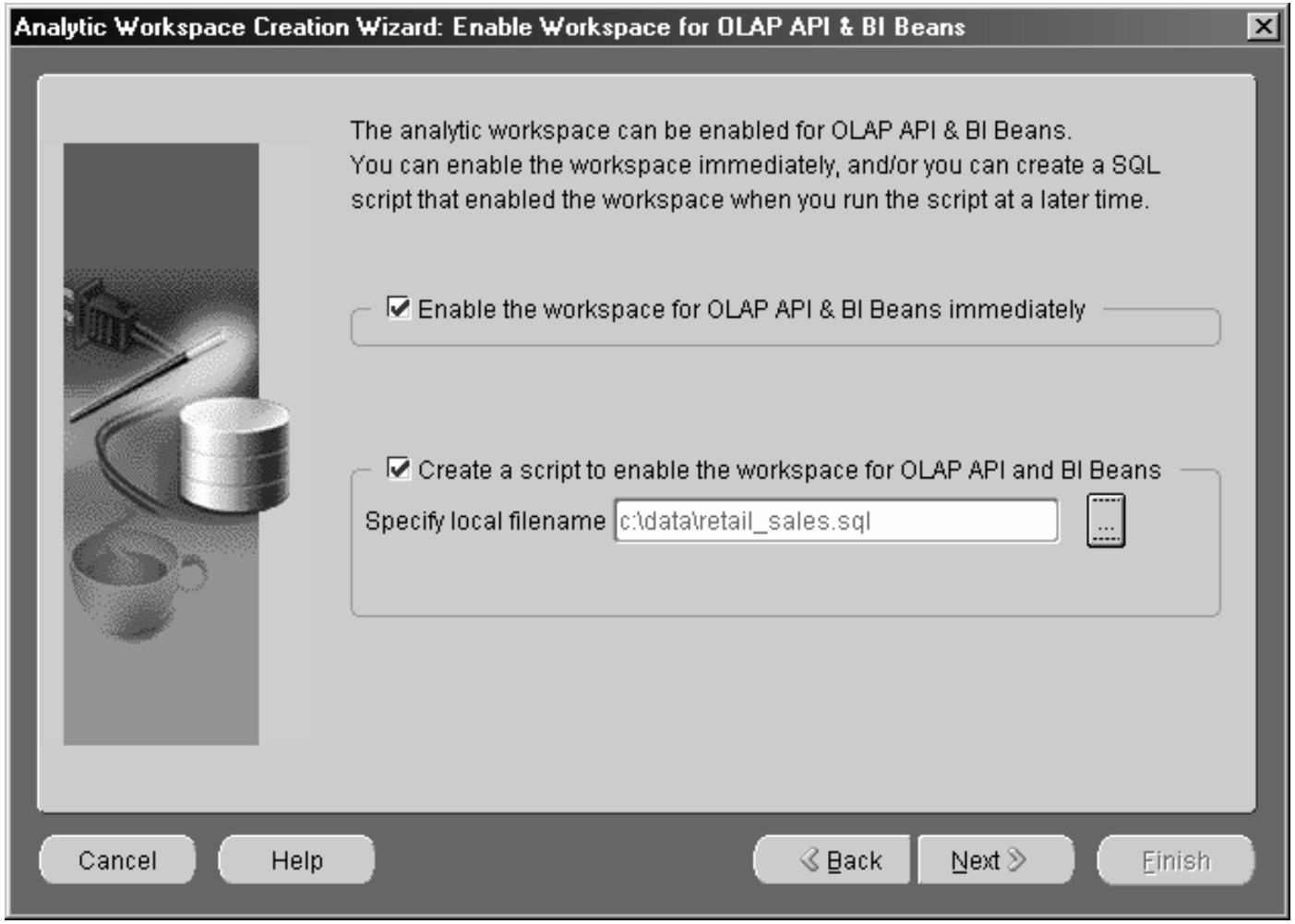
Analytic Workspace Manager



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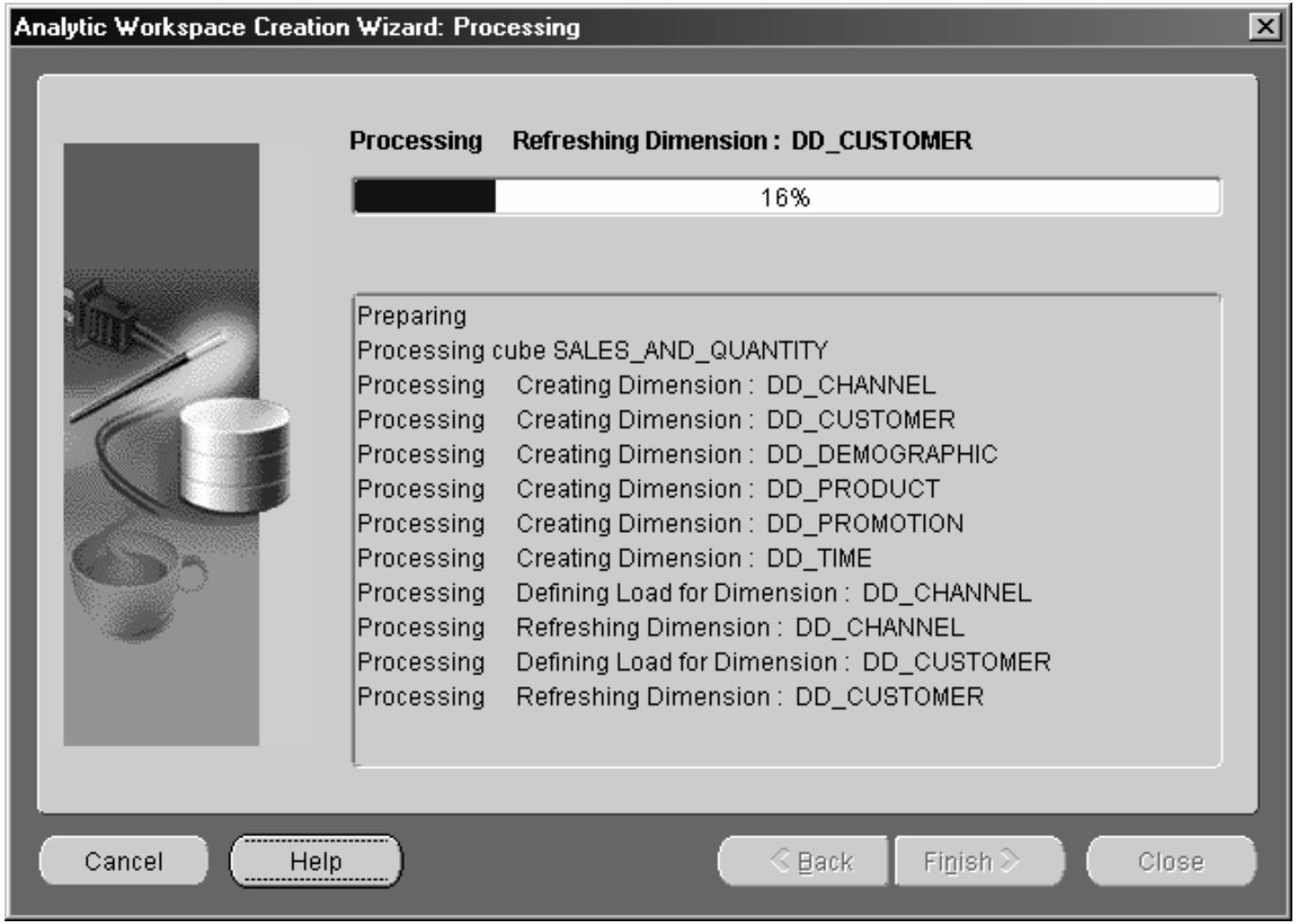
Analytic Workspace Manager



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AW Manager Demo

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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

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Questions?

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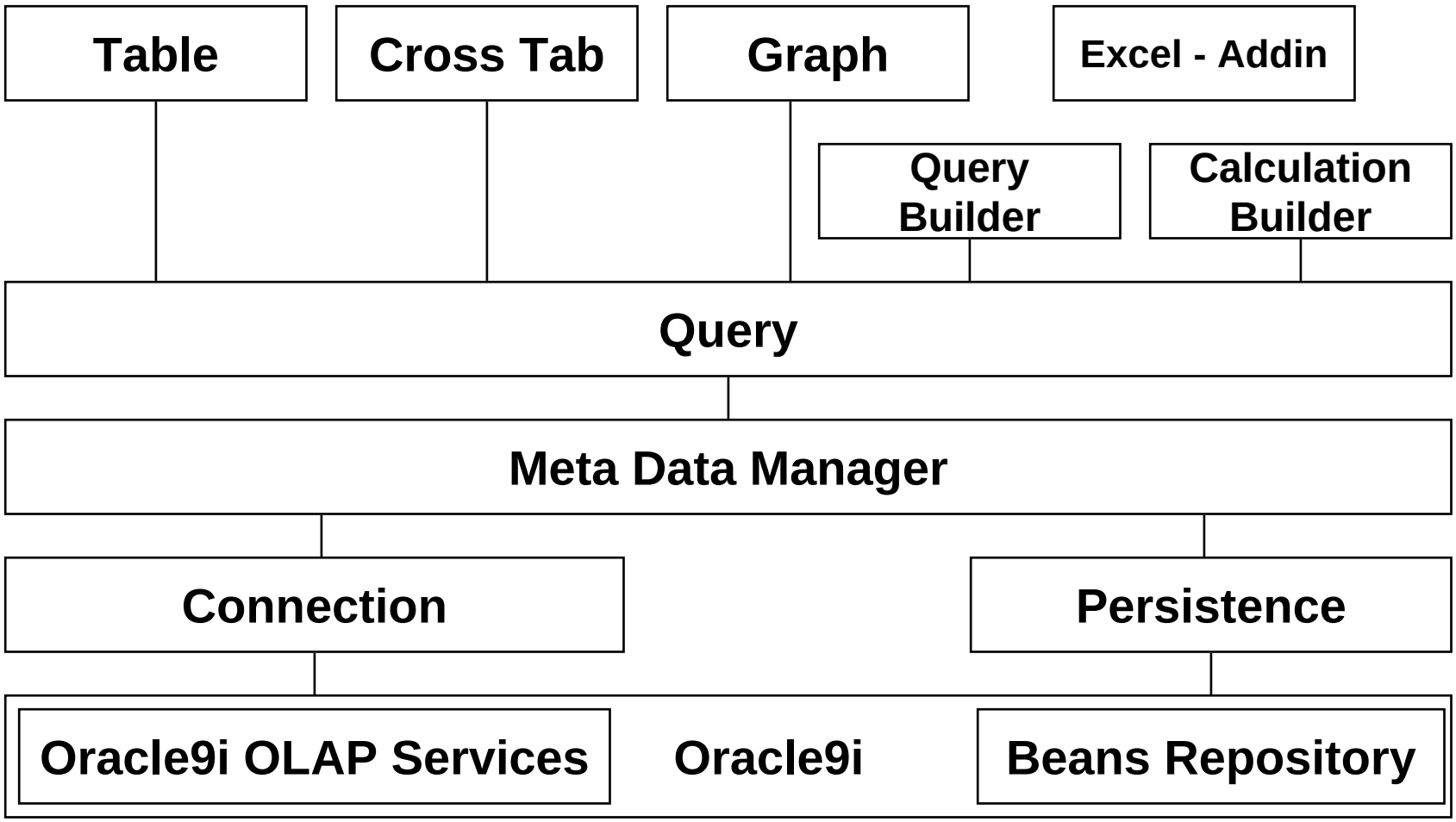
Business Intelligence Beans



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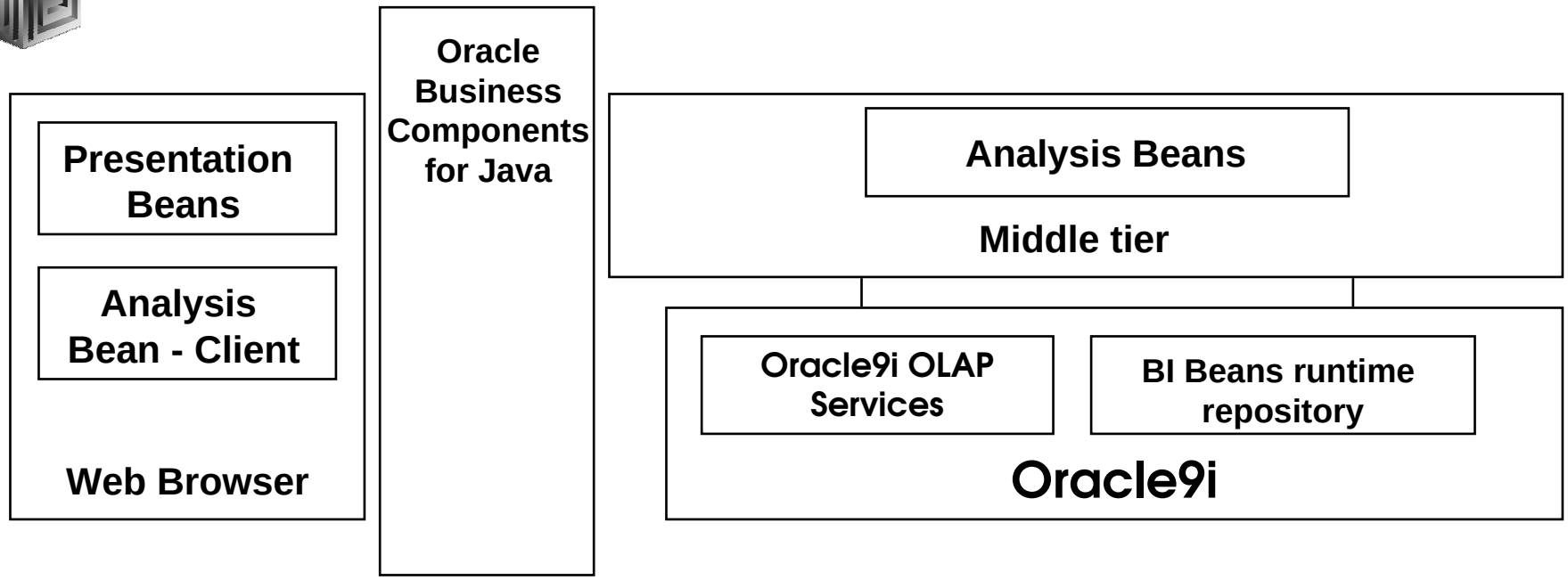
Architecture: Java clients



- 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

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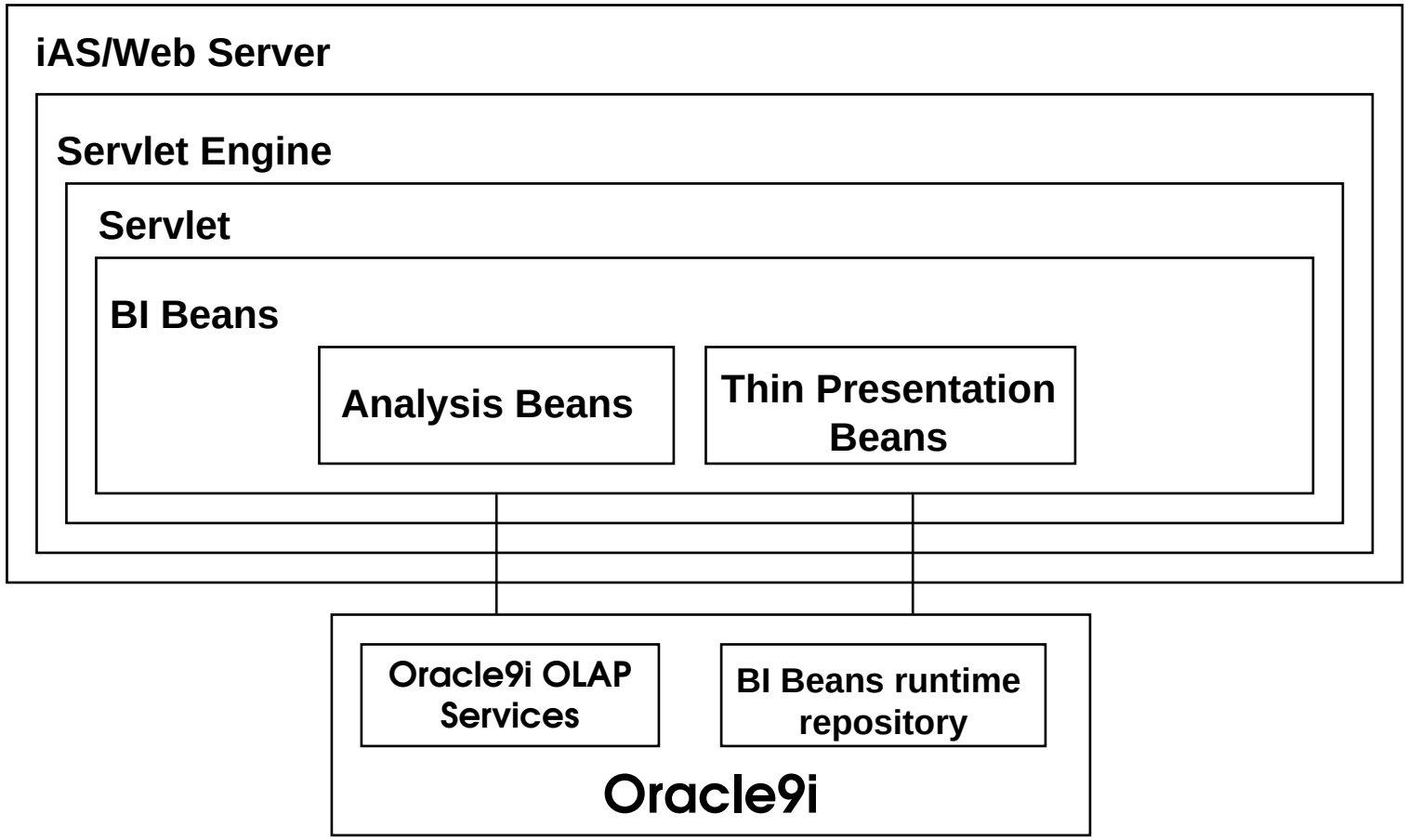
Architecture: Thin client



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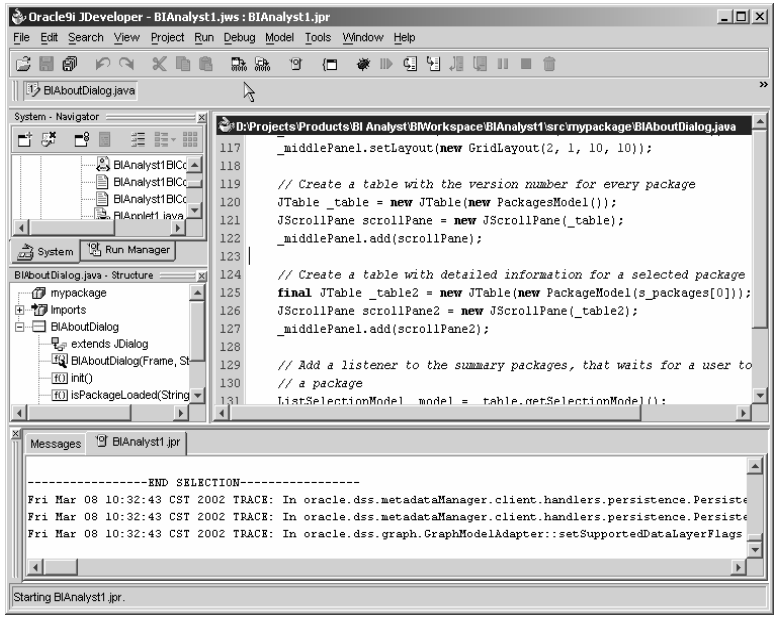
JDeveloper Integration

- Single Development tool for Relational and OLAP development
- Key design-time integration objectives
  - Use JDeveloper concepts; extend when necessary
  - Live data access
  - Run application objects
  - Extensive use of Wizards to support rapid development
  - Leverage BI Beans runtime repository to enable multiple



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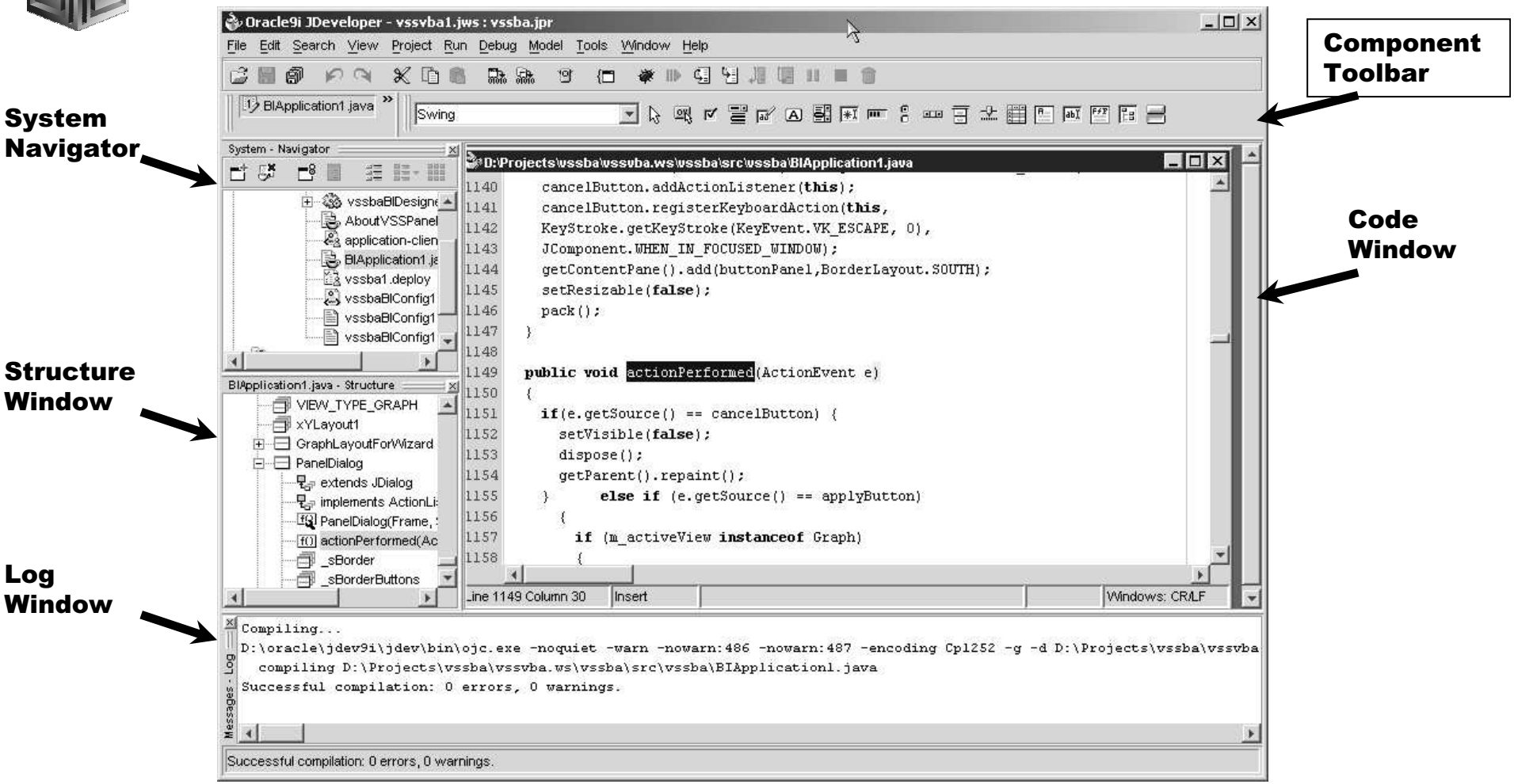
JDeveloper 9i Environment



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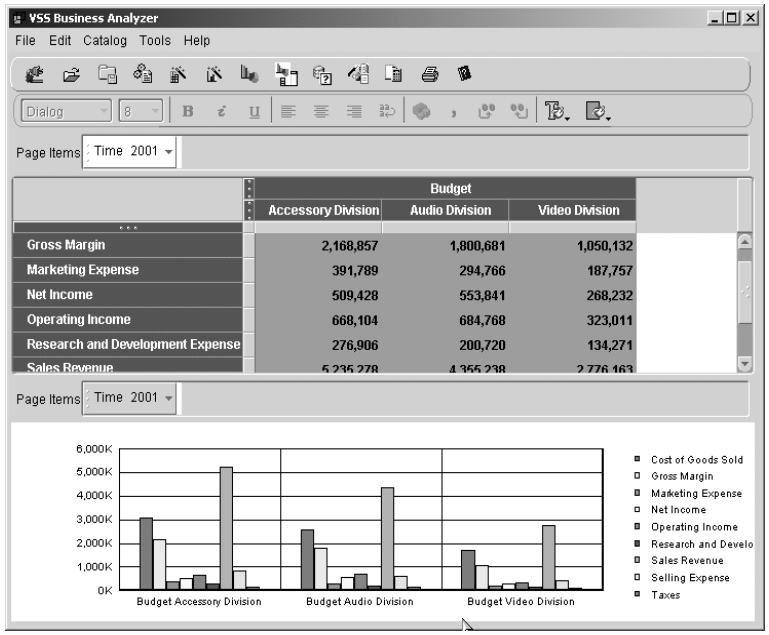
What Can We Really Do?

- 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 for more info…

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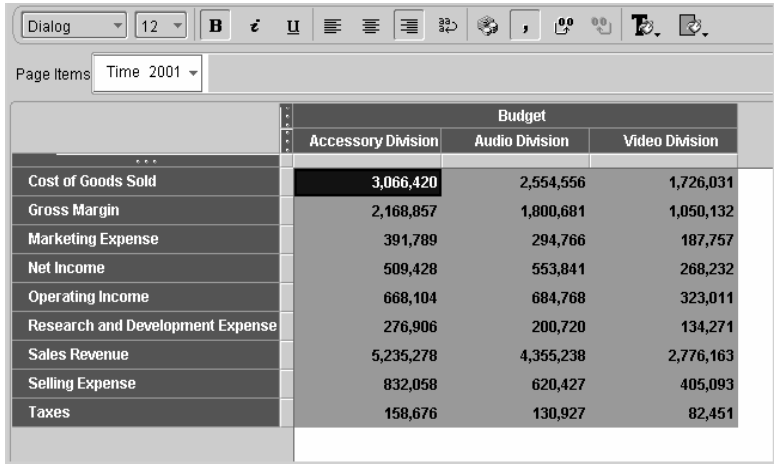
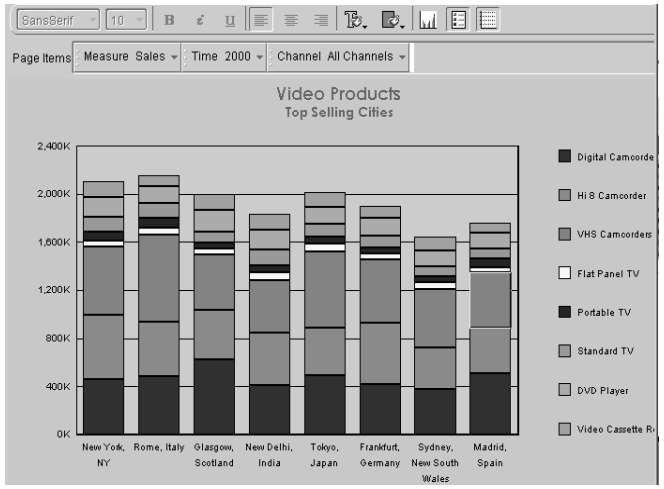
Presentation Beans

- 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



	Budget		
	Accessory Division	Audio Division	Video Division
Cost of Goods Sold	3,066,420	2,554,556	1,726,031
Gross Margin	2,168,857	1,800,681	1,050,132
Marketing Expense	391,789	294,766	187,757
Net Income	509,428	553,841	268,232
Operating Income	668,104	684,768	323,011
Research and Development Expense	276,906	200,720	134,271
Sales Revenue	5,235,278	4,355,238	2,776,163
Selling Expense	832,058	620,427	405,093
Taxes	158,676	130,927	82,451



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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

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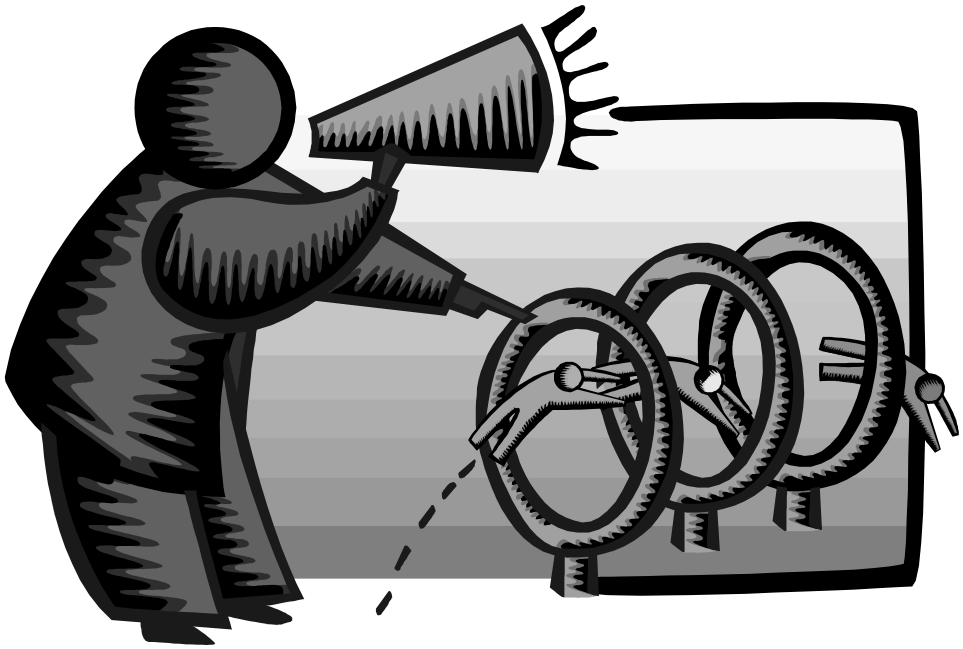
Demonstrations



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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

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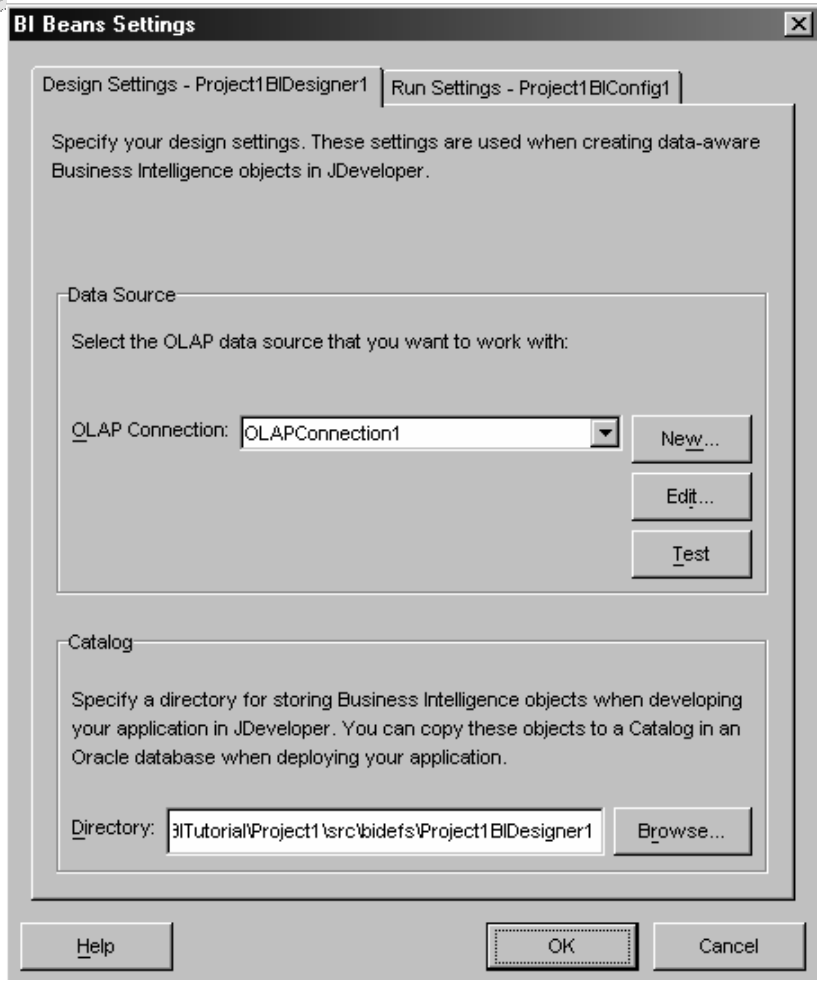
BI Beans Designer Settings



- 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

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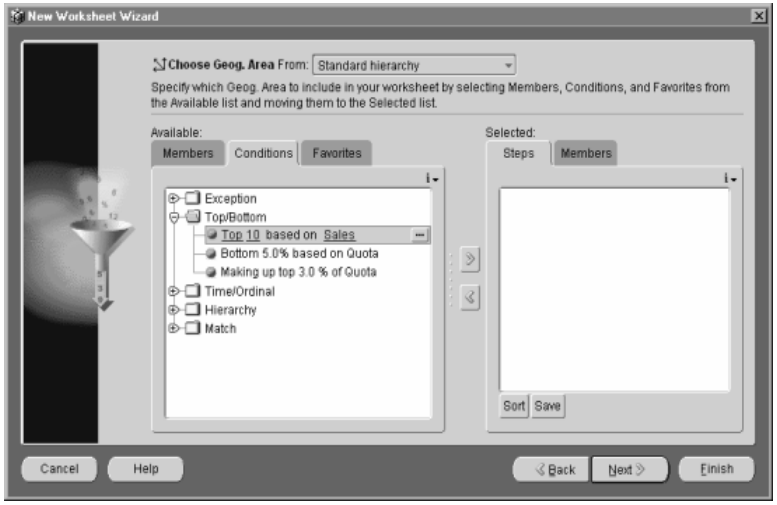
Query Builder



- "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

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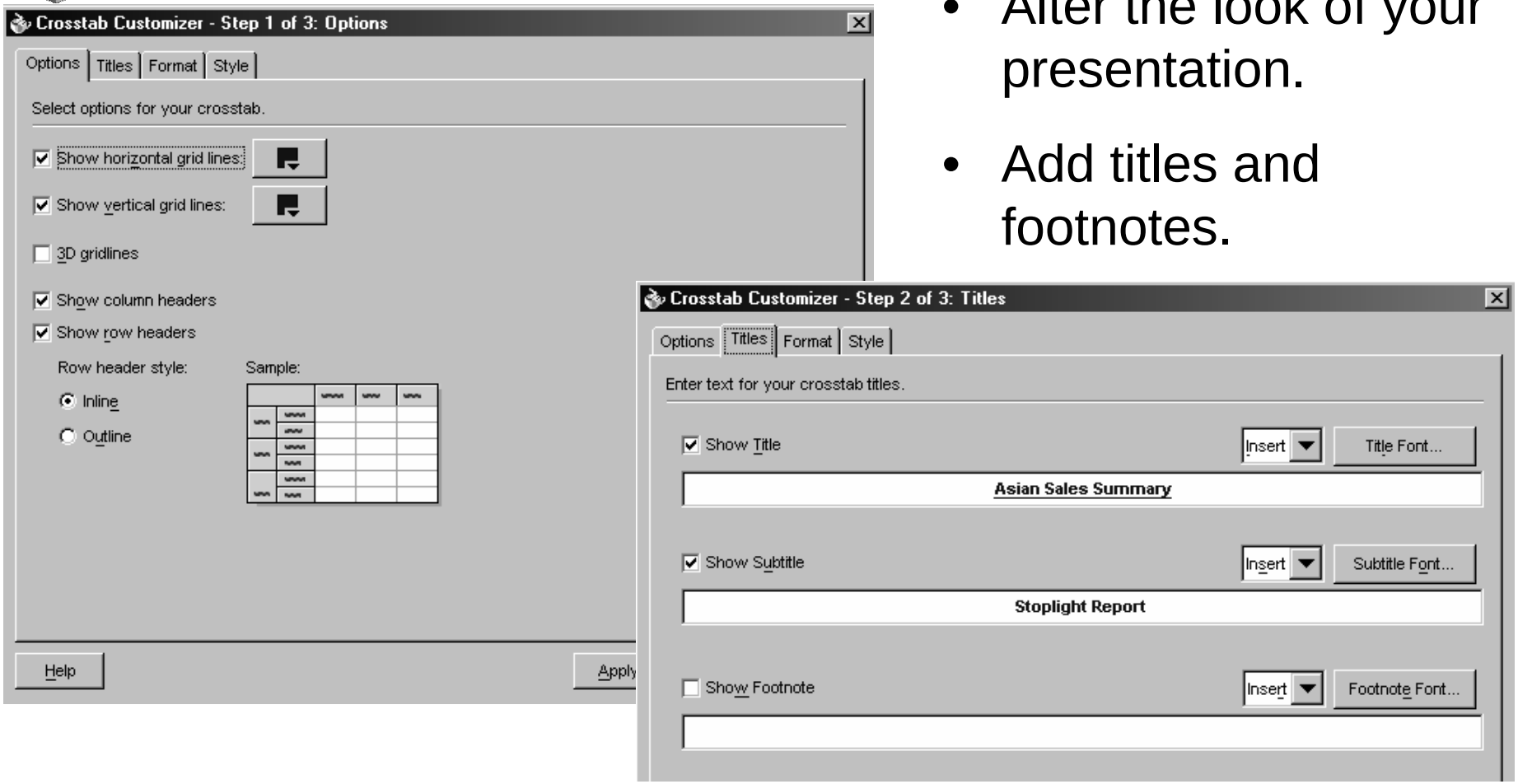
Customizer



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

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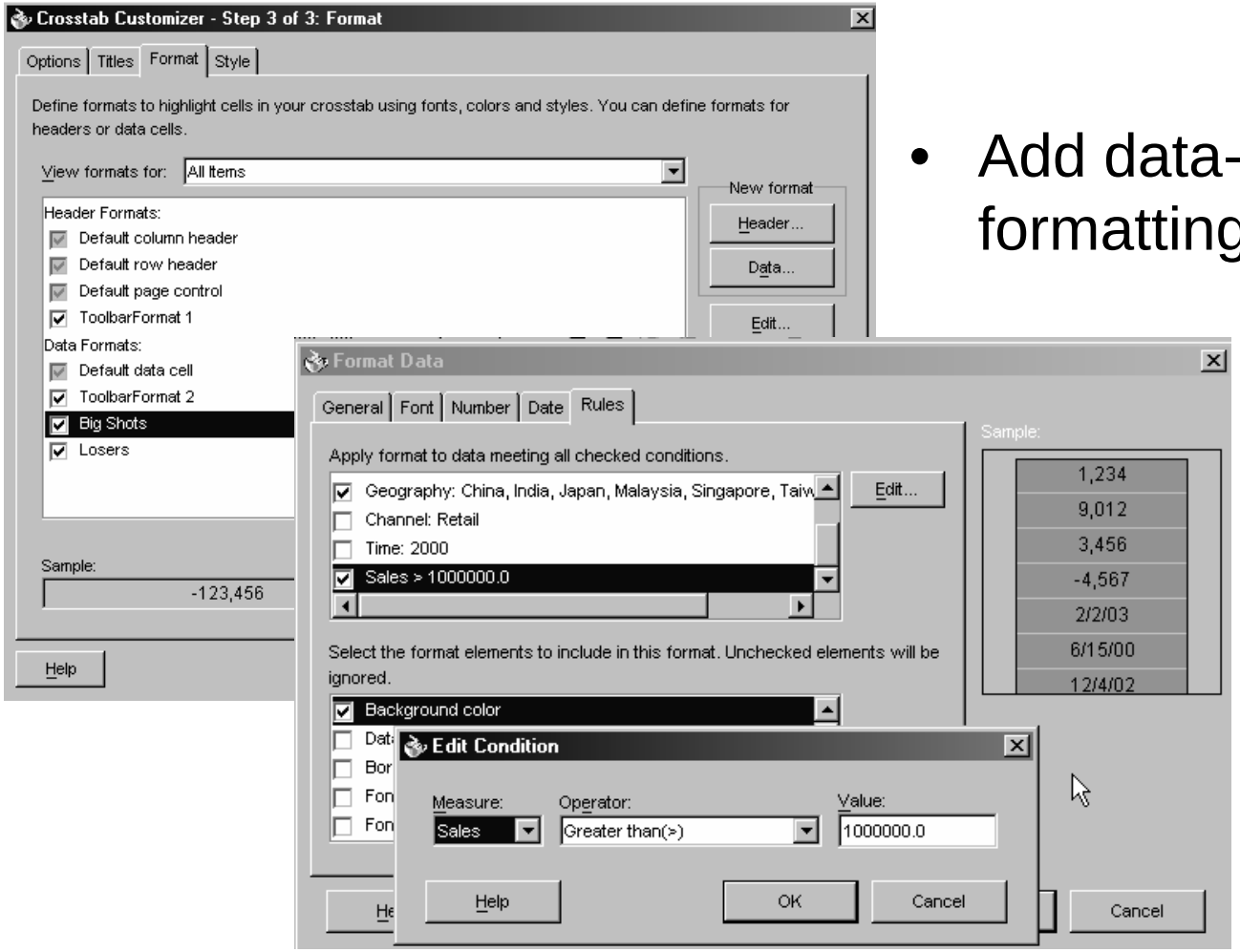
Customizer



- Add data-driven formatting.

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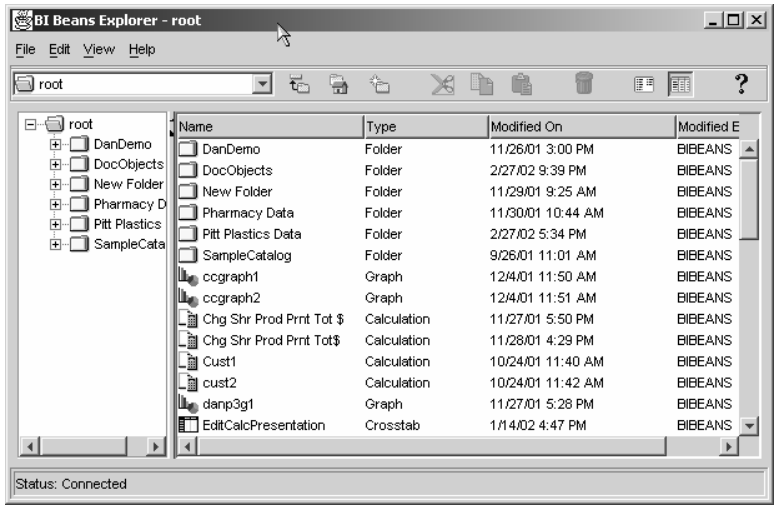
Persistence Services – BI Catalog

- 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



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Summary of Creating OLAP Cube

- Define star schema (OWB)
- Define ROLAP Cube (OWB or OEM)
- (opt.) Create AW from ROLAP cube (OWB or AWM)
- (opt.) BI Beans enable AW
- Run BI Beans app or write your own app
  - Jdeveloper (to write your own)
  - Excel Add-in
  - Discoverer for OLAP

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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

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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

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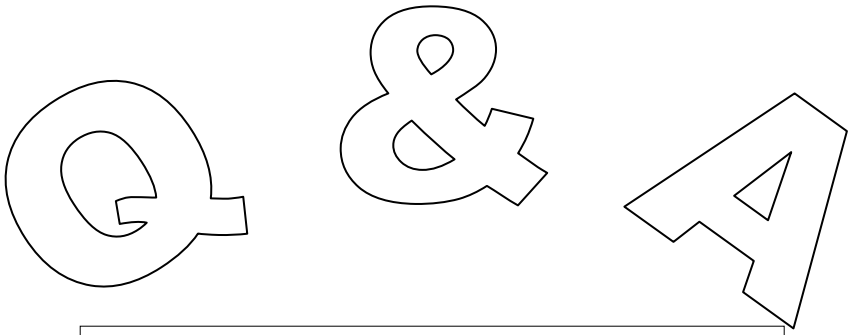

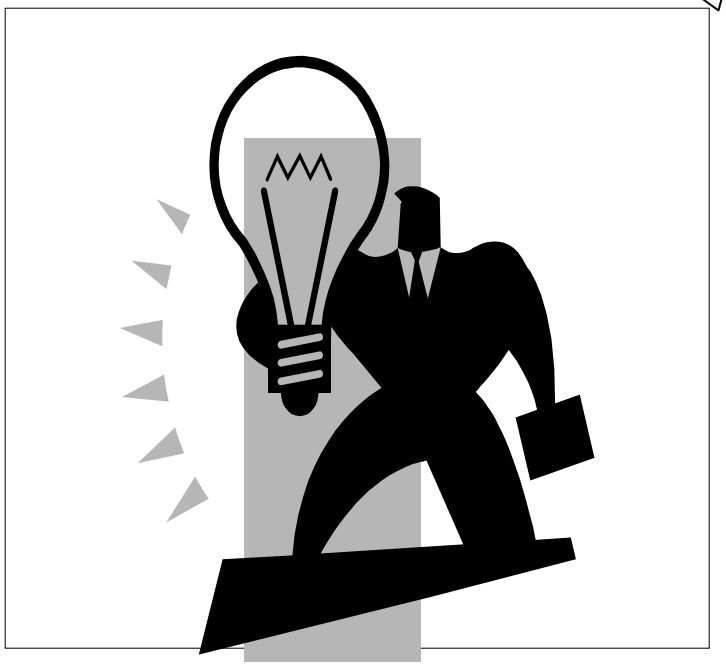

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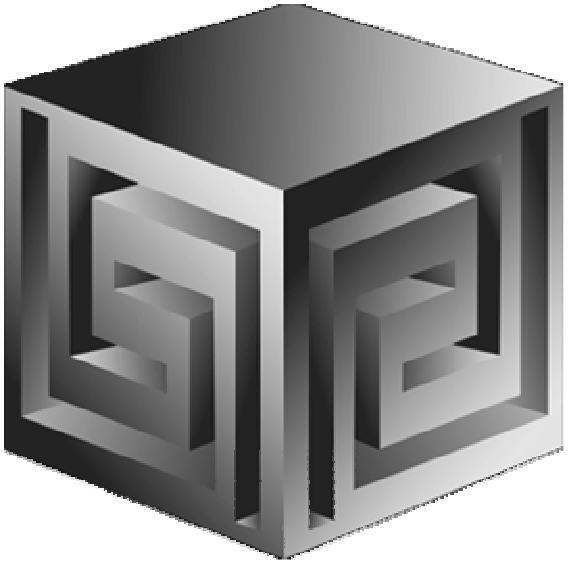
An End-to-End Solution Using OWB and JDeveloper to Analyze Your Data Warehouse

presented at
ODTUG 2004



Presented by:

Dan Vlamis (dvlamis@vlamis.com)

Vlamis Software Solutions, Inc.
(816) 781-2880

http://www.vlamis.com

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