

# **USING ORACLE WAREHOUSE BUILDER 9i AND ORACLE 9i TO CREATE OLAP READY WAREHOUSES**

*Chris Claterbos, Vlamis Software Solutions, Inc.  
Elizabeth Reardon, Vlamis Software Solutions, Inc.*

## **INTRODUCTION**

With the use of the new features found in Oracle's Warehouse Builder(OWB) 9i and Oracle 9i we can now design, construct and load a data warehouse that is fully OLAP ready. This presentation will introduce the attendee to OWB 9i and Oracle 9i OLAP and how to design and construct an Oracle 9i database that can be used for OLAP analysis and presentation. Implementation and design issues will also be addressed. A step-by-step guide will be presented with the end result being a completed OLAP ready datamart.

## **WHAT IS OWB?**

The major functional areas of data warehousing from ETL tools to data storage is contained within the OWB framework. OWB is a key component in Oracle's Intelligent Webhouse initiative, enabling the design and deployment of data warehousing and business intelligence solutions. The core of OWB is the Common Warehouse Metadata, which is the open metadata interchange standard driven by the OMG partners such as Oracle, IBM, NCR, and Unisys.

OWB provides a comprehensive framework for designing and deploying data warehousing and business intelligence applications across the enterprise. It consists of the following functional components:

### **REPOSITORY**

All of the user's work is stored in an Oracle 8i based repository. The repository is based upon an interim release of the Common Warehouse Metadata (CWM) standard. This repository consists of a set of tables that are stored in the Oracle 8i database that all OWB users and runtime applications share.

### **GRAPHICAL USER INTERFACE**

The OWB client is used to perform all tasks necessary for the design and administration of the OWB project. It is written entirely in Java and can be run from any machine that can run the Java runtime environment.

### **CODE GENERATION**

OWB generates the code for creation of the database objects as well as the code to transform and load the data into the data warehouse.

### **INTEGRATION**

There are several components within OWB that function as data integrators. A majority of these integrators are dedicated to the extraction of data from a particular type of data source. The primary integrator provides support for Oracle relational data sources. Other relational, non-relational and flat file sources are also supported. Specialized integrators are also supplied to support Oracle Applications as well as SAP R/3. In addition to the data extraction integrators there is also integration with Oracle Business Intelligence applications, Discoverer and Oracle OLAP. It is the use of this functionality that will be addressed in this paper.

## **OLAP INTEGRATION**

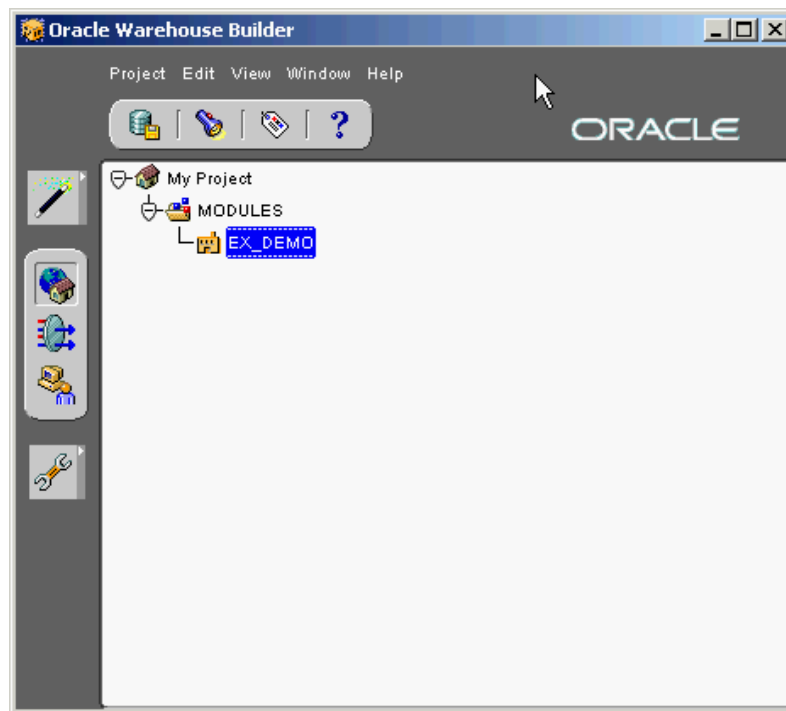
The integration of OWB and Oracle OLAP is performed through the use of the CWMLite repository contained in the Oracle 9i Enterprise Edition and the

## **EXAMPLE SCENARIO**

One of the easiest ways to illustrate how to build an OLAP database with OWB is to show the process using an example application. The following sections show the process that is used to create a database design, validate the design, create the tables in Oracle 8i, transfer the design to OLAP and create the OLAP database.

### **CREATE THE DATABASE DESIGN**

Once the main screen is loaded, you then select the module that you will work with. OWB uses a concept of a module, which is a logical grouping of related objects. The warehouse module is a collection of the definitions of the objects comprising the data warehouse. When this is selected the Module Edit screen will display the objects that are part of the module. Definitions for such things as dimensions, facts, staging tables are all contained in the warehouse module and are shown in Figure 2.



*Figure 1. OWB Main Screen*

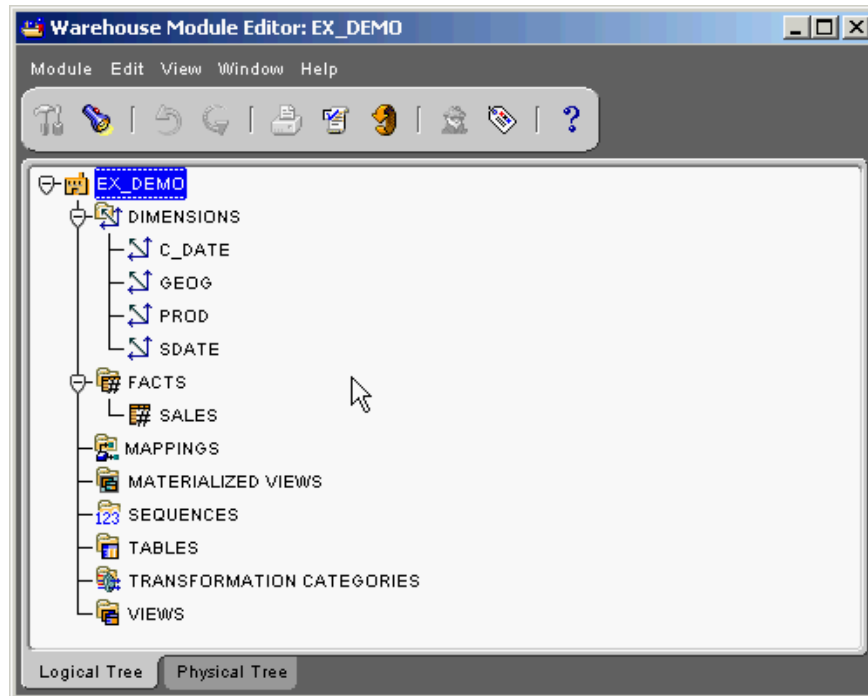


Figure 2. Module Editor

The first thing that is created in the design are the various dimensions that will be used by the fact tables. Once the dimensions are defined then the facts can be specified. The fact contains all of the related measures that will have the same dimensions. Figure 3. Illustrates a simple sales fact table design with two measures, actual and budget, and three dimensions.

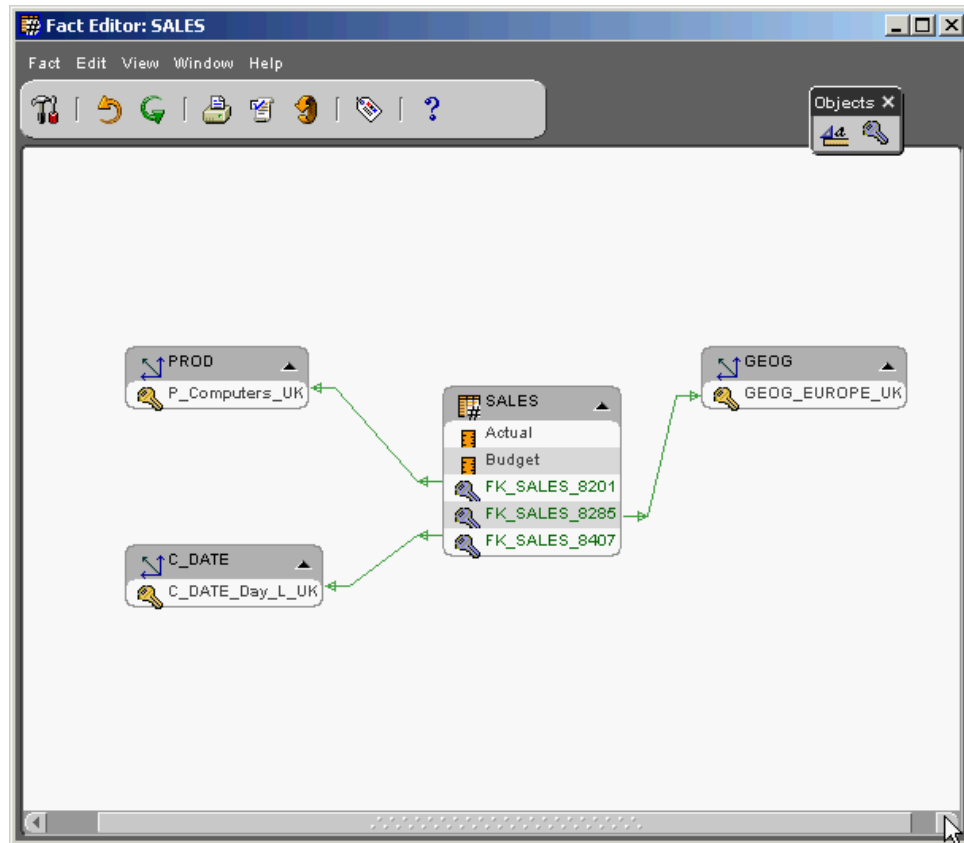


Figure 3. Fact Editor

When the design is complete the work is saved to the repository and if desired the design can be validated to make sure that the specifications are correct and consistent. The physical database scheme DDL can now be generated as well creation of all of the physical database objects. After all of this has been completed the design is now ready to create a database that can be made OLAP aware. The relational database is now generated and the relational tables populated with data.

### OWB AND 9i OLAP INTEGRATION

The integration of OWB and 9i OLAP is performed through the use of the One Meaning Bridge or CWM Bridge. This bridge allows for the transfer of the database design in OWB to the metadata tables of the 9i OLAP Services. The bridge creates entries in the CWM metadata that matches the design in OWB. Once the metadata is created/updated the OLAP Cube is visible via the OLAP management facilities provided by OEM and also available to be viewed via 9i OLAP enabled applications.

### OEM OLAP MANAGEMENT

Once OWB and the OLAP Bridge have accomplished their tasks the design can be viewed and modified as required the OLAP Management functions in Oracle Enterprise Manager (OEM).



Figure 4. OLAP Management in OEM

Once in the OLAP Manager the dimensions that were created by OWB can be seen by selecting the Dimensions area of the tool (figure 5).

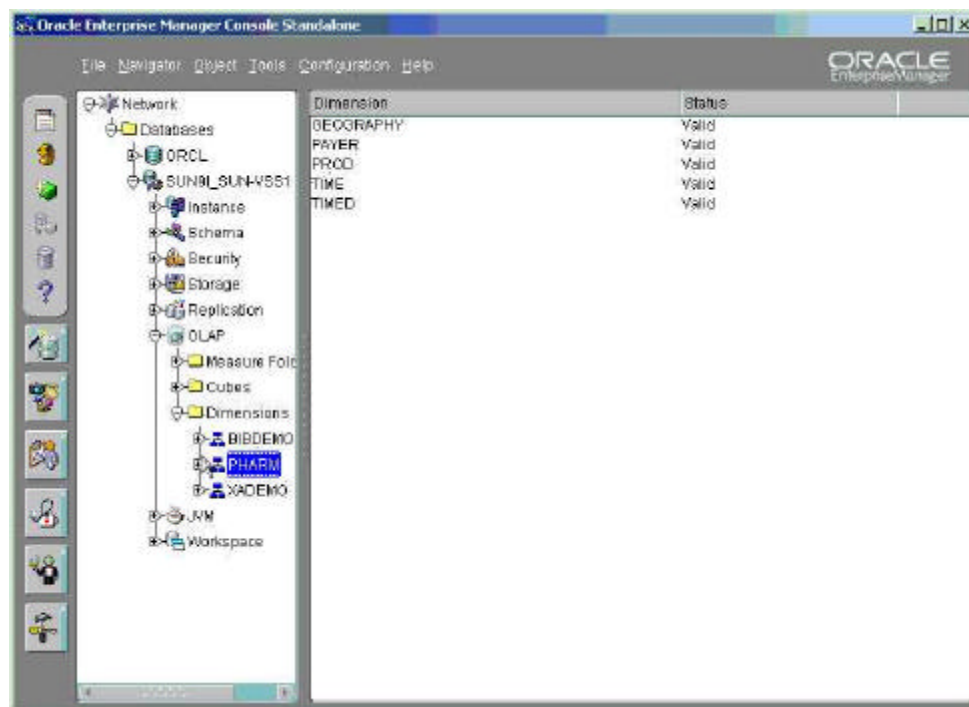


Figure 5. List of Dimensions available

The user now view what are called Cubes, which represent the tying of the Fact Tables and the Dimensions together. The completed Cube contains measures that are ready to be viewed via OLAP front ends such as BI Beans. OEM has a simple viewer, called Cube Viewer, that can be use to view the data within OEM allowing the user to make sure that all the definitions worked correctly.

Additionally, the user can group the data into Folders that allow multiple cubes of data to be presented to users as in a single folder. This makes it much easier to present measures and other objects to users in a more organized fashion as well as implement various security models. Figure 6. shows an example of what the Measure Folders looks like.

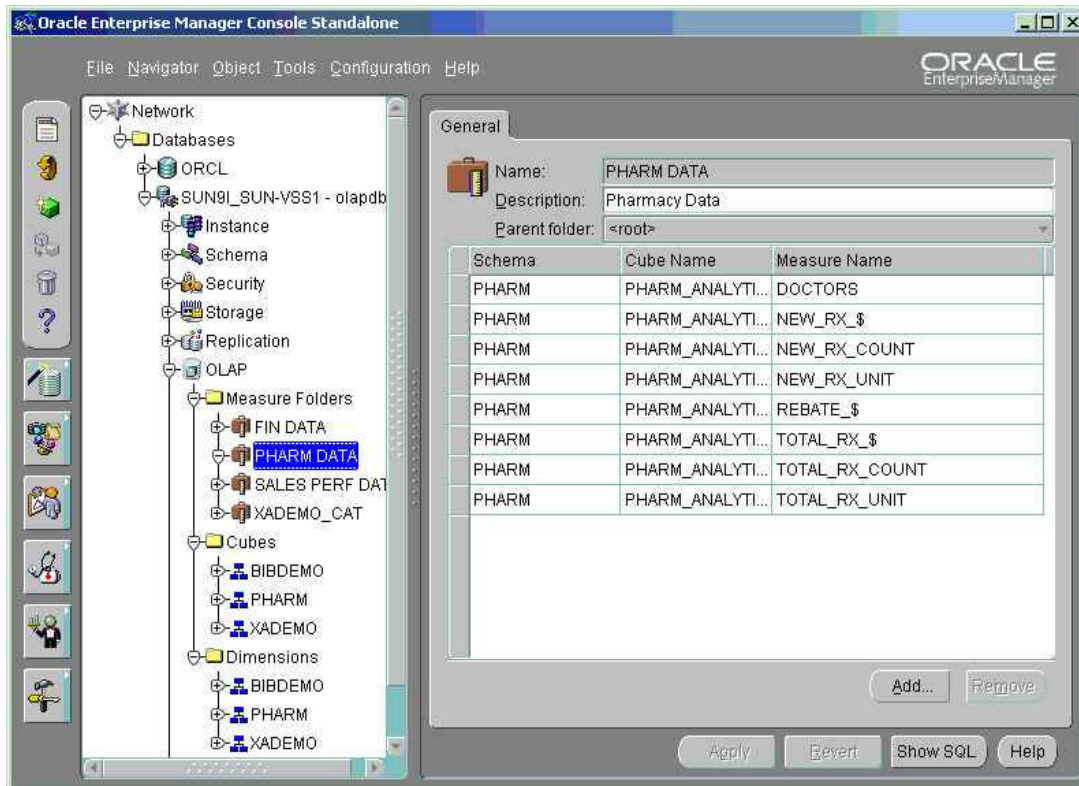


Figure 6. Measure Folders

After the data has been loaded into the relational fact and dimension tables it is immediately available to be viewed using any of the various OLAP front-end Query tools like BI Beans and VSS's BI Analyzer.

## **CONCLUSION**

OWB and the CWM are the cornerstones of Oracle's current and future data warehouse and business intelligence initiatives. The future promises more integration and tools that will make the designer and applications developer easier and provide a fully integrated view of enterprise data.

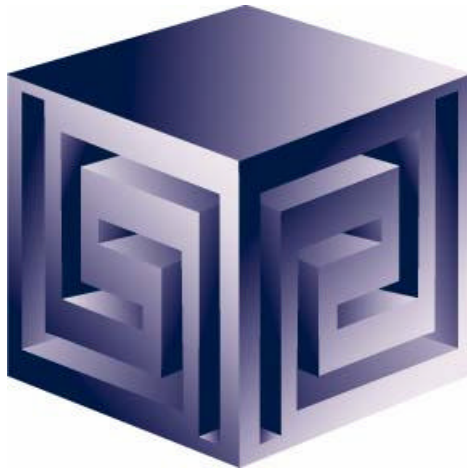
The current implementation of OWB supports limited integration with the OLAP analytical engine. Even though the support of OLAP is limited to the relational access manager components of OLAP it provides a glimpse into

the future where one design tool can be used to design, build, populate and maintain the entire enterprise data warehouse and data mart.

# Using Oracle9i Warehouse Builder and Oracle 9i to create OLAP ready Warehouses

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Paper #422



**Chris Claterbos**  
**claterbos@vlamis.com**

**Vlamis Software Solutions, Inc.**  
**(816) 729-1034**  
**<http://www.vlamis.com>**

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## Vlamiis Software Solutions, Inc.

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- **Founded in 1992 in Kansas City, Missouri**
- **A Member of Oracle Partner Program since 1995 along with various Oracle Beta Programs**
- **Designs and implements databases/data marts/data warehouses using RDBMS and Multidimensional tools**
- **Specializes in Data Transformation, Data Warehousing, Business Intelligence, Oracle Financials and Applications Development**
- **Founder Dan Vlamiis is former developer at Oracle-Waltham office for Sales Analyzer Application**
- **Oracle Certified Solutions Provider**



# Using OWB to Build Express Databases



- ☐ What is OWB?
- ☐ Oracle 9i Integration
- ☐ The Process
- ☐ CWM Bridge
- ☐ Demonstration
- ☐ Questions



# What is Oracle Warehouse Builder?

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- **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**
- **Future integration platform for Express**



# What is OWB?

## Components: Overview

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### **Components of Oracle Warehouse Builder**

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



## Components: *OWB Repository*

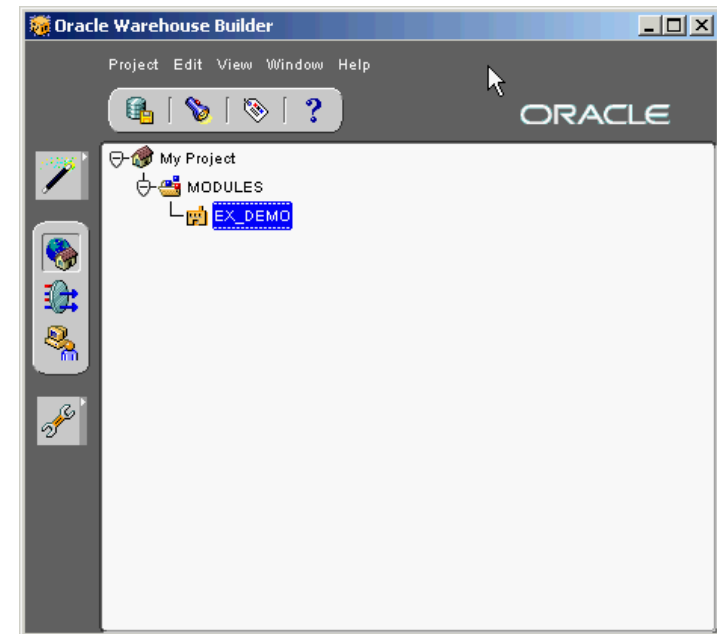
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- **Based upon Common Warehouse Metadata Standard (CWM)**
- **Supports Industry Standards**
- **Oracle 8i/9i based**
- **Integration point for future products (Designer, Developer, BI Beans ...)**



## Components: *OWB User Interface*

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





## Components: *Code Generators*

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**Code Generators are provided for:**

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



## Components: *Integrators*

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- **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*

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



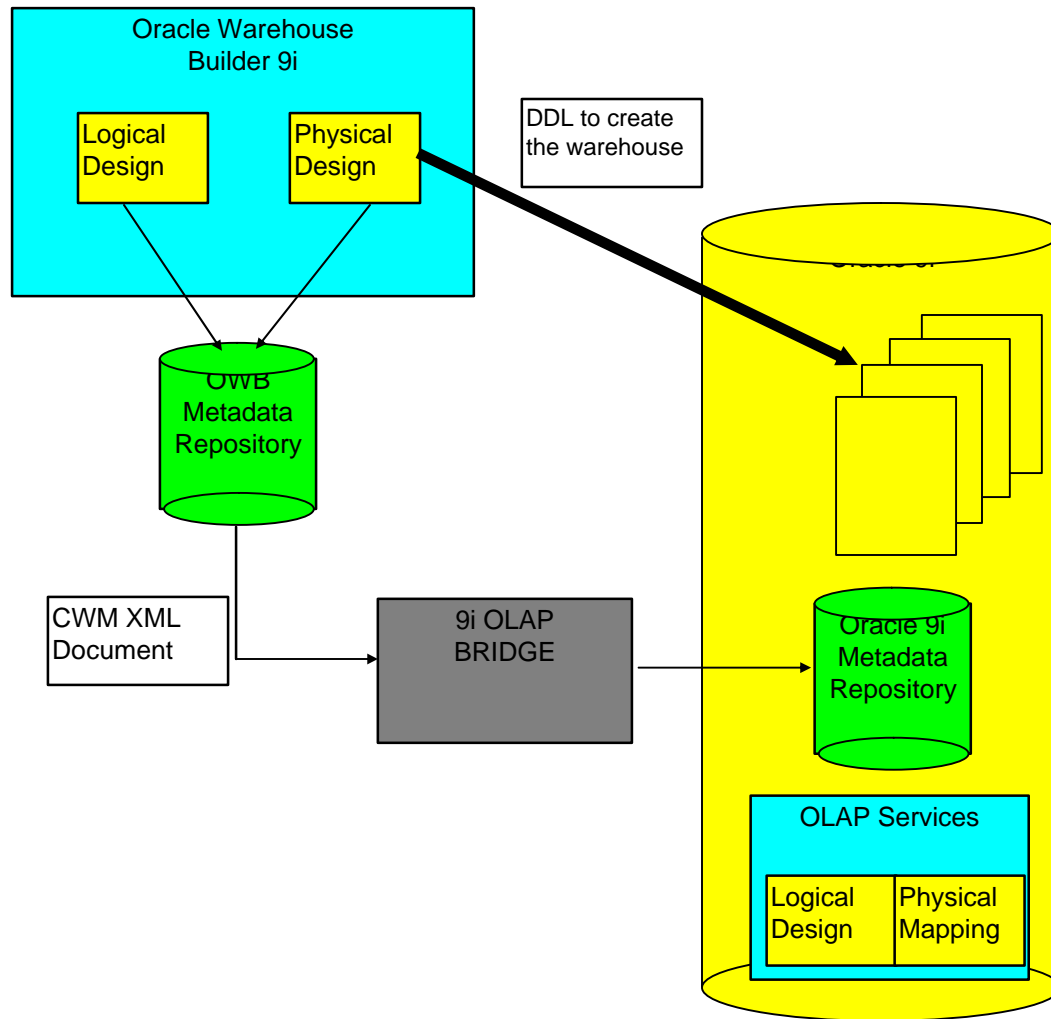
## 9i OLAP Integration

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- **OWB Bridge transports OWB metadata to Oracle 9i OLAP Metadata**
- **Creates links to Relational Data for Facts and Dimensions**
- **User can use OEM Cube Builder to make changes**
- **Future Bridge will allow Bi-Directional Integration**



# CWM Bridge





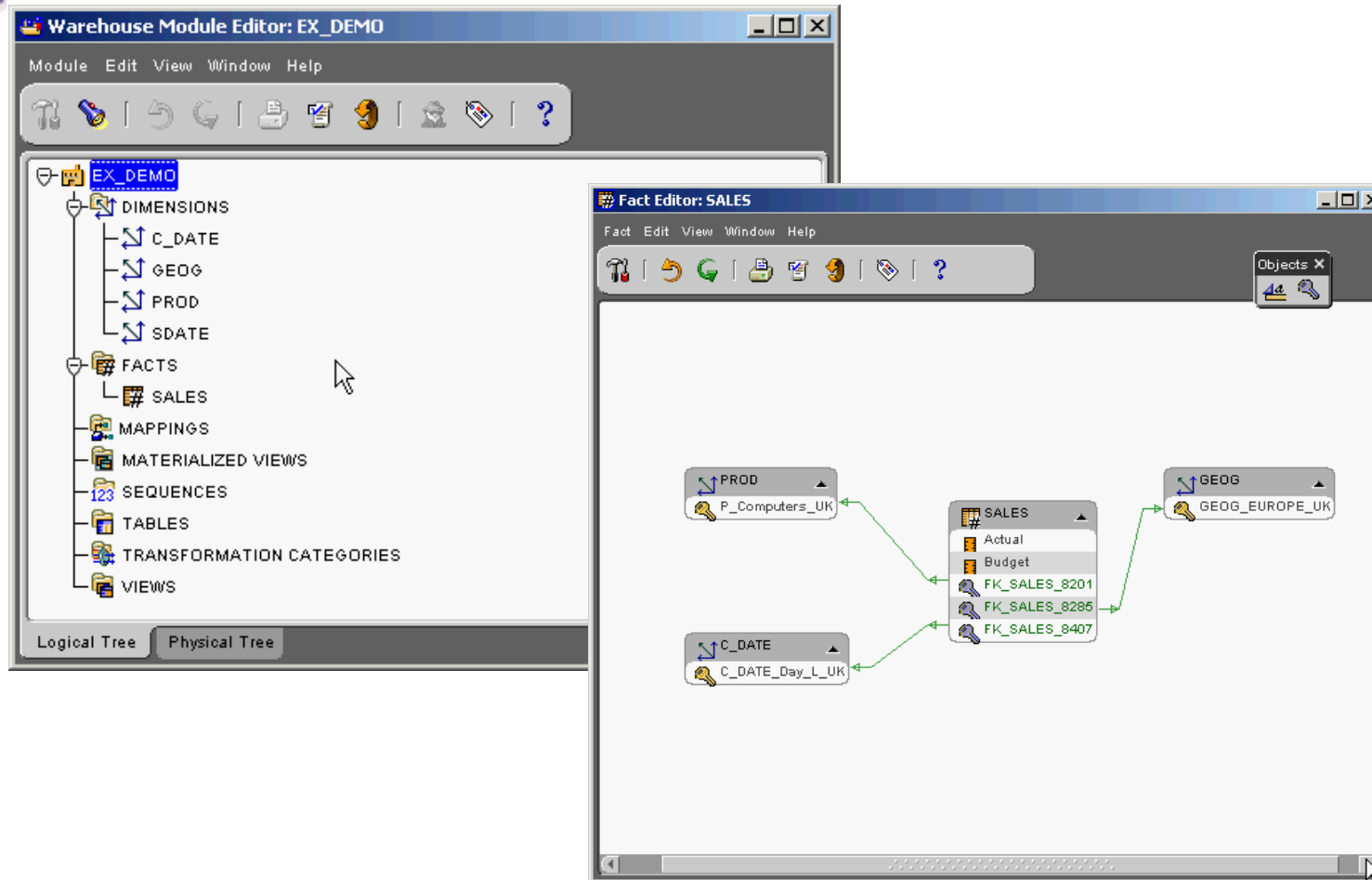
# The Process

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

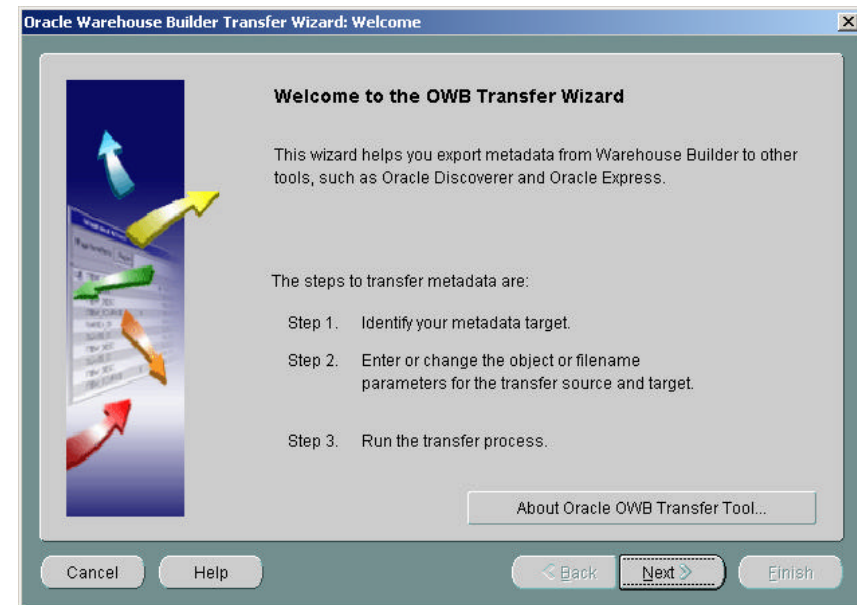
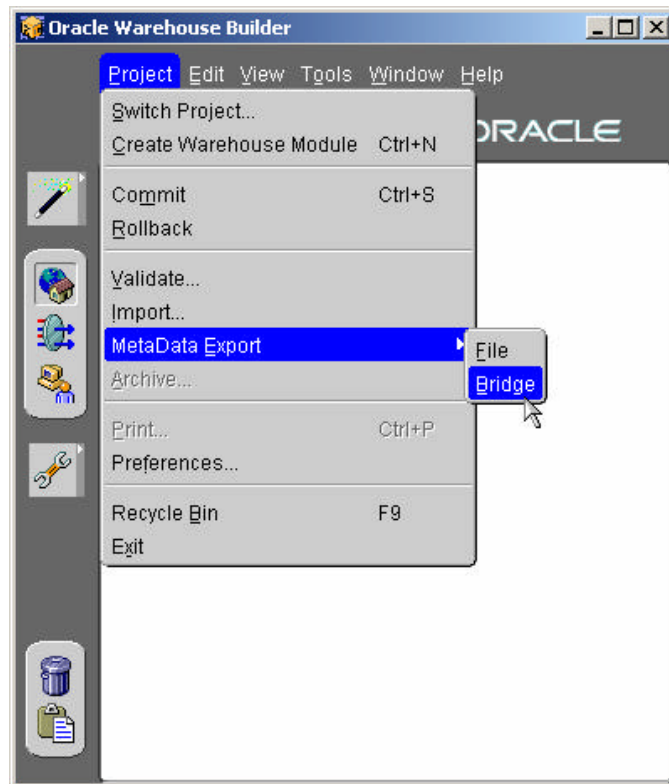


# Design and Generate Schema





# Metadata Export - Bridge





# OWB Transfer Wizard

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- **What does the OWB to 9i OLAP Transfer do?**
  - ☐ **Converts Metadata to CWM Format**
  - ☐ **Create SQL Script to update 9i OLAP Metadata**
  - ☐ **Executes Script**



# 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

OMG CWM Export  
Oracle OLAP Server Import  
Oracle Discoverer3  
Oracle Express  
Oracle Discoverer4

Cancel Help < Back Next > Finish





# CWM 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 Business Areas	All Business Areas
Username	BIBDEMO
Password	*****
Hostname	chris-insp4000
Port	1521
SID	orcl
PL/SQL Output File	D:\Projects\IOUGA-2002\IOUGA-2002.sql
Deploy PL/SQL in database	No
Log Level	Information

Cancel Help < Back Next > Finish



# CWM Bridge – Transfer Parameters

Oracle Warehouse Builder Transfer Wizard, 3 of 3: Summary

**Confirmation of Oracle WB Transfer**

From:  To:

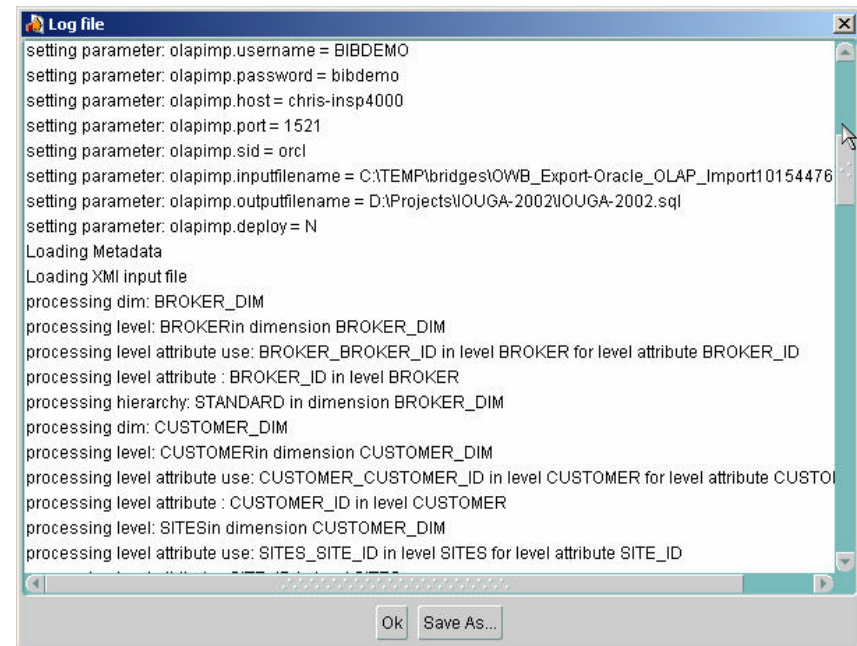
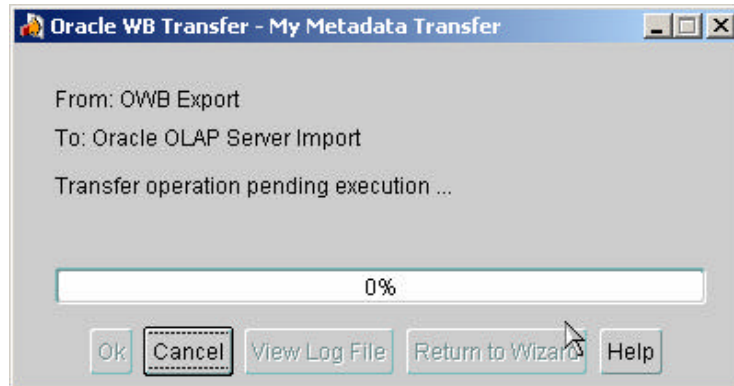
Description:

Transfer Parameter Name	Transfer Parameter Value
OWB Exported Business Areas	All Business Areas
Username	BIBDEMO
Password	*****
Hostname	chris-insp4000
Port	1521
SID	orcl
PL/SQL Output File	D:\Projects\IOUGA-2002\IOUGA-2002.sql

Click Finish to begin the transfer process.

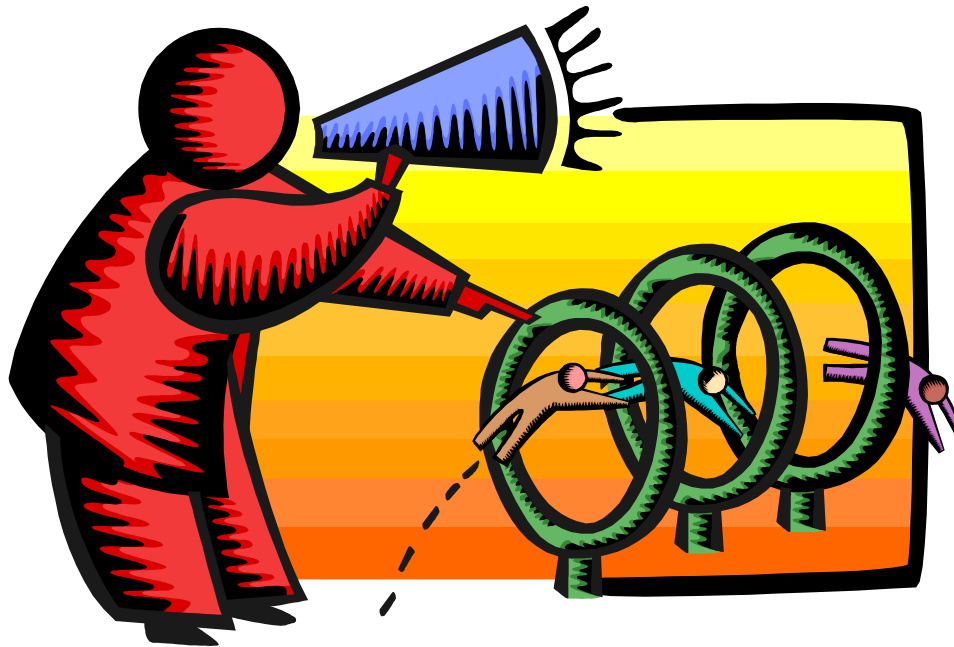


# CWM Bridge – Running





# Demonstration



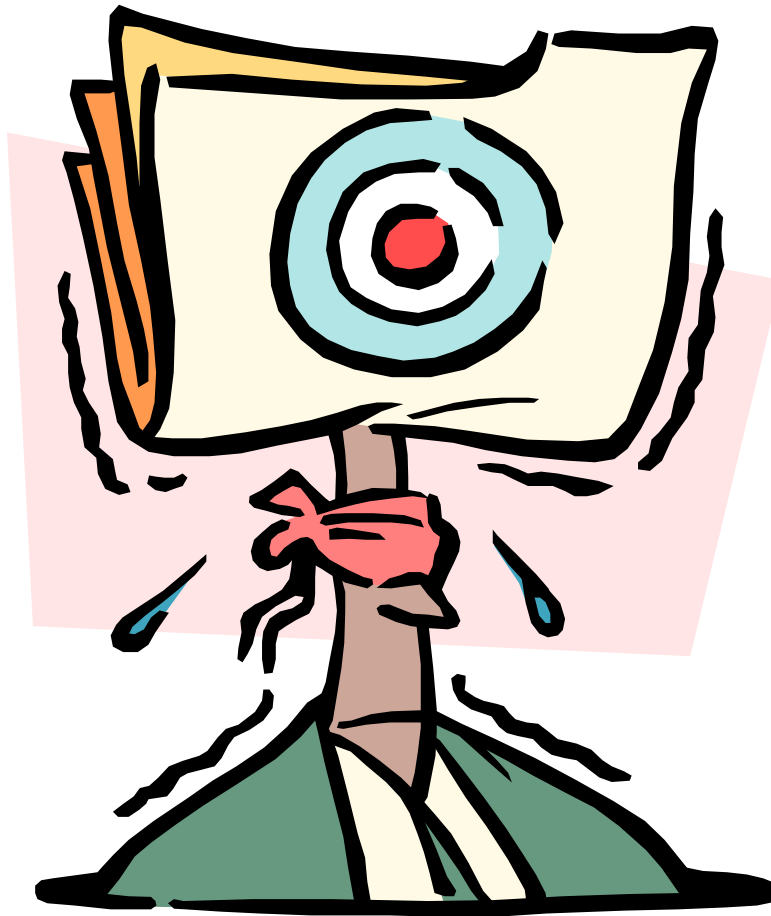


# Conclusions

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- **We can finally design OLAP Solutions**
- **Strong Foundation for the Future**
- **Still Lacking all the Pieces**
  - ☐ **No Bi-Directional Bridge**
  - ☐ **Only goes to ROLAP**
  - ☐ **No Migration for Express Databases**

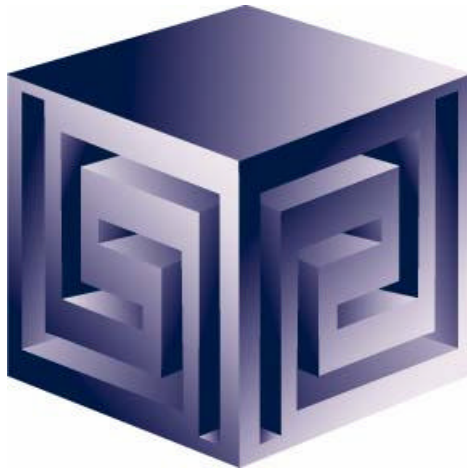
# QUESTIONS?



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