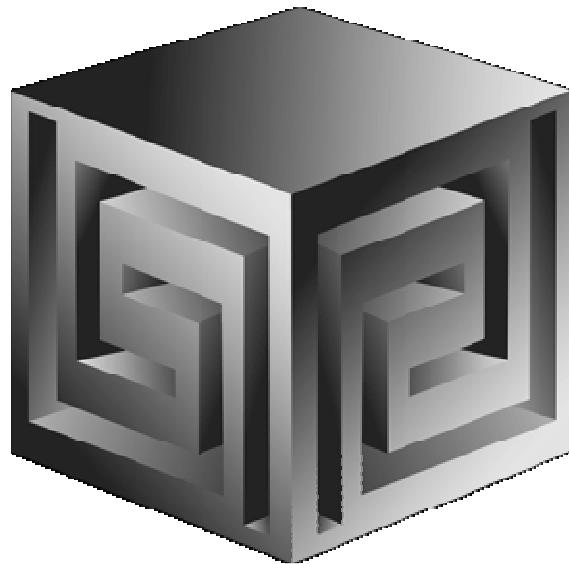


Oracle BI and Oracle OLAP-- What's All This About?

Omaha Solid Foundations 2006



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Vlami Software Solutions, Inc.

- **Founded in 1992 in Kansas City, Missouri**
- **Oracle Partner and reseller since 1995**
- **Specializes in ORACLE-based:**
 - ☐ **Data Warehousing**
 - ☐ **Business Intelligence**
 - ☐ **Data Transformation (ETL)**
 - ☐ **Web development and portals**
 - ☐ **Express-based applications**
- **Delivers**
 - ☐ **Design and integrate BI and DW solutions**
 - ☐ **Training and mentoring**
- **Expert presenter at major Oracle conferences**



Who Am I?

- **Dan Vlamis, President of Vlamis Software**
 - ☐ Developer for IRI (former owners of Express)
 - ☐ Founded Vlamis Software in 1992
 - ☐ Beta tester and early adopter of Oracle OLAP
 - ☐ Expert speaker and author
 - ☐ “Techie” on OLAP DML
 - ☐ Recognized expert in Express and OLAP industry

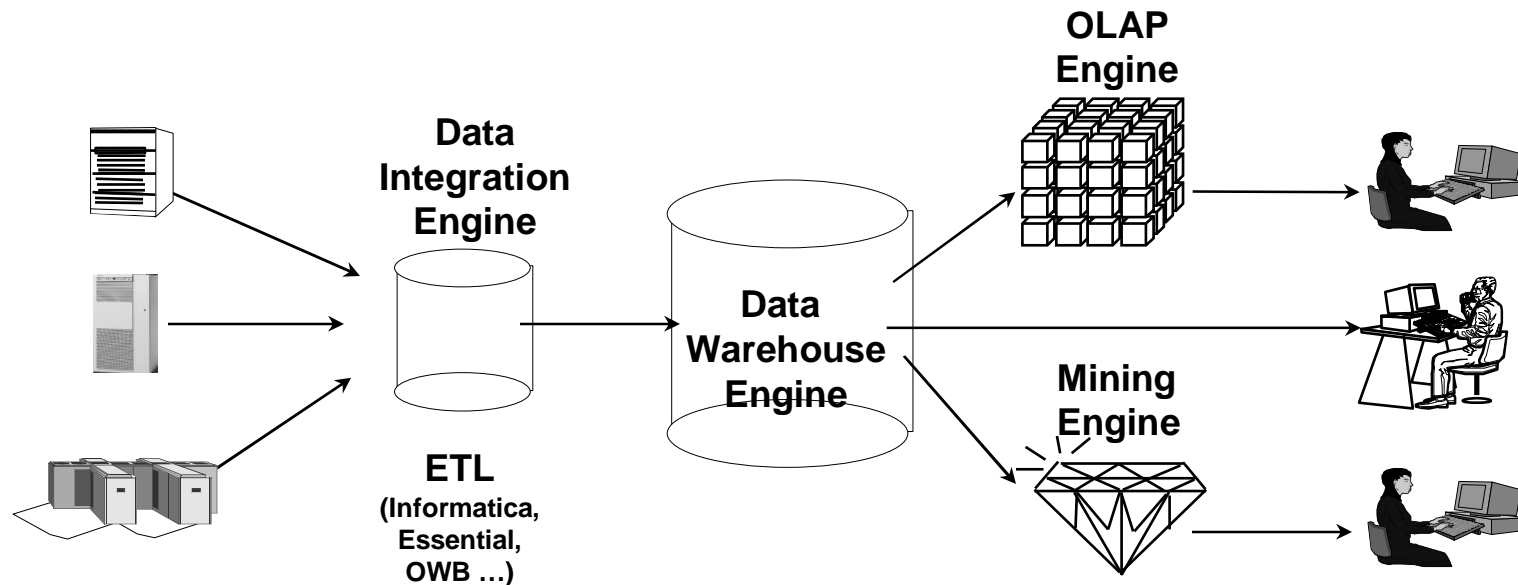


Agenda

- **Oracle BI / OLAP background**
- **What is Oracle OLAP / BI?**
- **What are multi-dimensional cubes?**
- **Building OLAP cubes**
- **Options for analyzing / displaying cubes**
- **Oracle BI product stack**
- **Case studies with Oracle BI / Oracle OLAP**
- **Design tips**



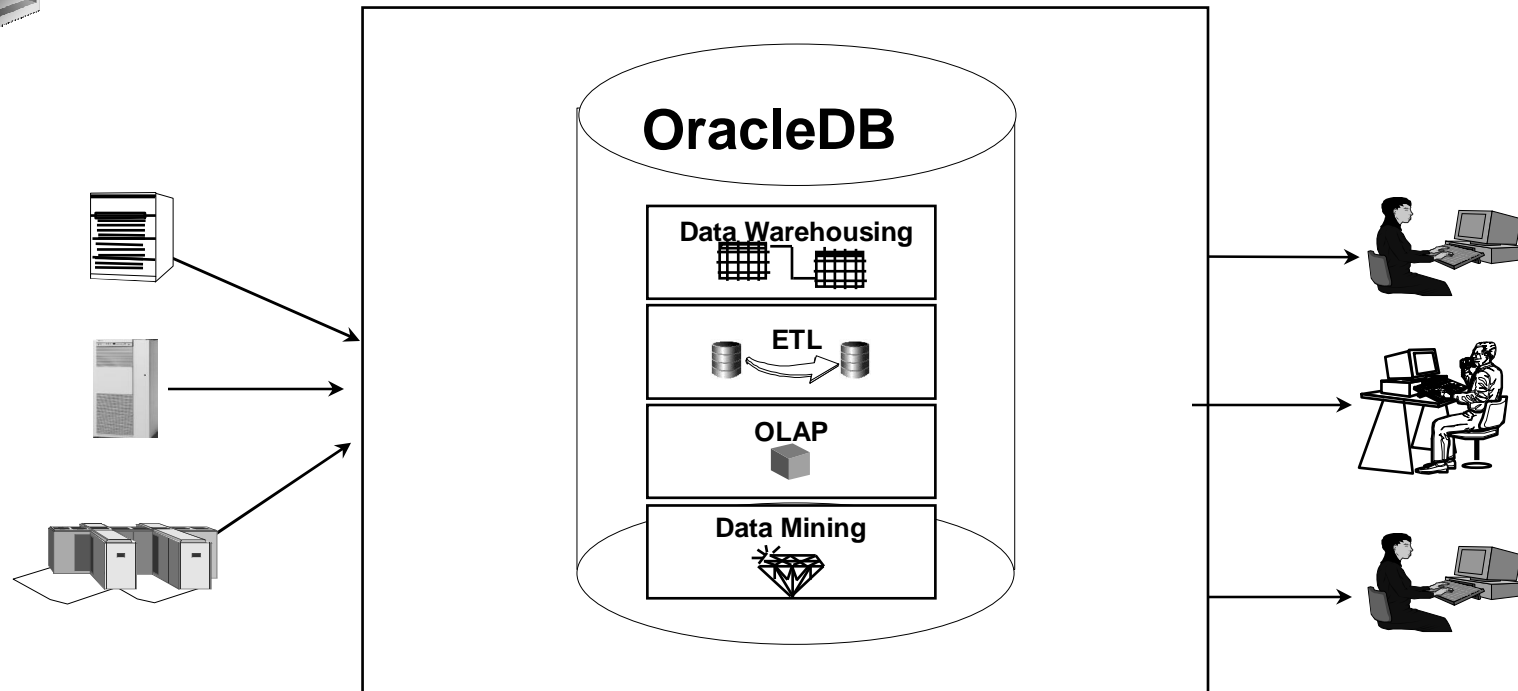
Business Intelligence the Old Way



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

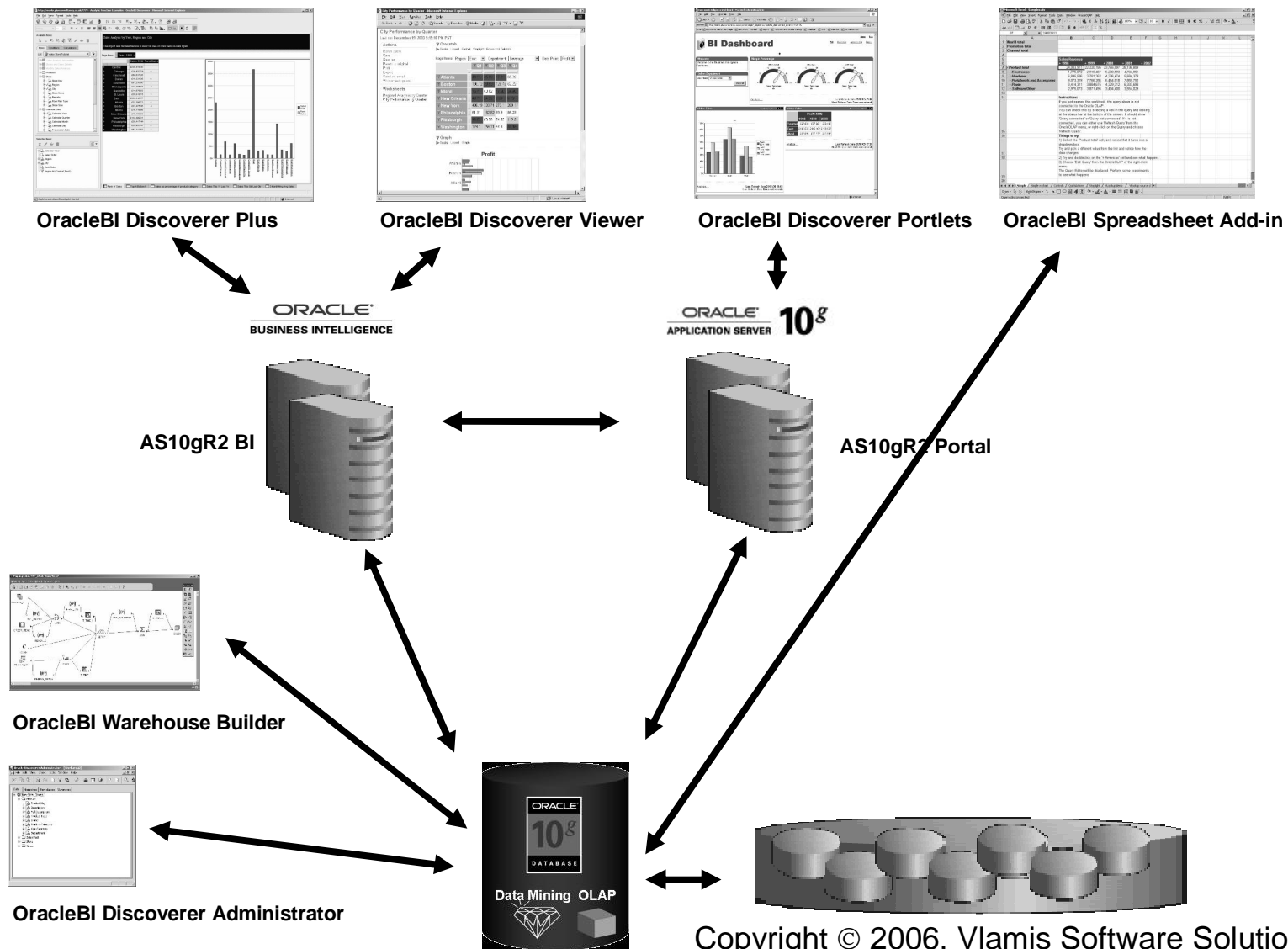


BI the New Way: Oracle DB



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

Oracle BI Product Architecture





Definition of OLAP

OLAP stands for On Line Analytical Processing.
That has two immediate consequences: the *on line* part requires the answers of queries to be fast, the *analytical* part is a hint that the queries itself are complex.

i.e. Complex Questions with FAST ANSWERS!



Why a Separate OLAP Tool?

- **Empowers end-users to do own analysis**
- **Frees up IS backlog of report requests**
- **Ease of use**
- **Drill-down**
- **No knowledge of SQL or tables required**
- **Exception Analysis**
- **Variance Analysis**



What Does Oracle OLAP Add to a DW?

- **Multidimensional user view of data**
- **Users create own reports**
- **Users create own measures**
- **Easy drill-down, rotate**
- **Iterative discovery process (not just reports)**
- **Ad-hoc analysis**
- **Easy selection of data with business terms**
- **OLAP DML with what-if, forecasting**
- **Platform for extensions**



OLAP Option – High-level View

- **Advanced analytics**
- **Integrated in RDBMS**
- **Easy to develop**
- **Easy to use**
- **Facilitate collaboration**
- **Flexible deployment**
- **Scaleable and performant**
- **True Relational – Multidimensional database**



OLAP Option – Technical View

The OLAP Option consists of five key elements:

- 1. Multidimensional data types, used for holding cubes and dimensions, temporary or stored permanently in LOBs within schemas**
- 2. A multidimensional calculation engine**
- 3. A Java development framework with reusable OLAP components**
- 4. Extensions to SQL to allow SQL access to these multidimensional datatypes**
- 5. An additional layer of OLAP-specific metadata known as the OLAP Catalog**



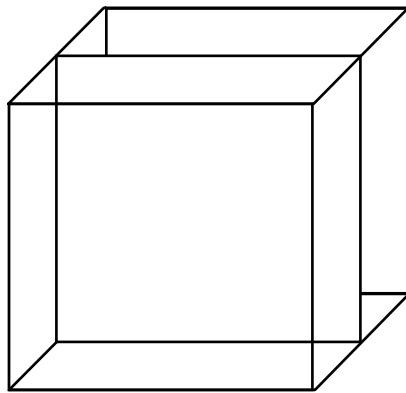
AWs Allow for What-if

- **Modeling organizational changes**
 - ☐ territory realignments
 - ☐ product hierarchy changes
- **Product new launches**
 - ☐ model new products after established product
- **Forecasting**
 - ☐ multiple scenarios
 - ☐ personal overrides of forecast
 - ☐ spread down of higher-level overrides
 - ☐ locks

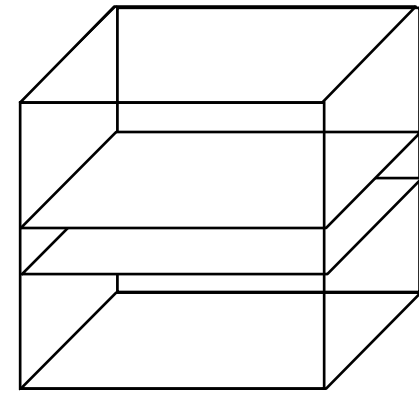
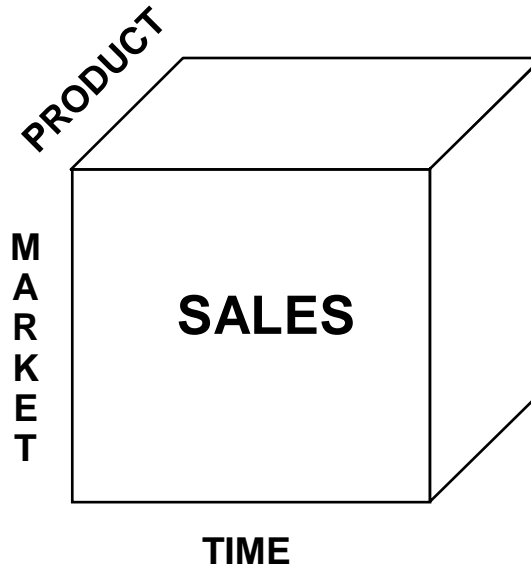


OLAP AW Stores Data in Cubes

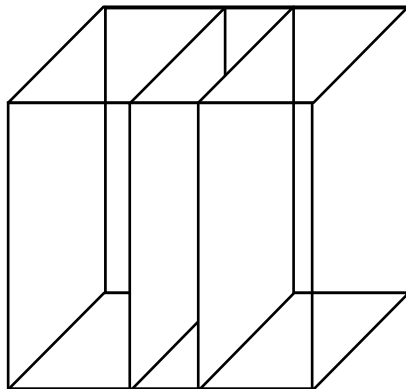
Fast Flexible Access to Summarized Data



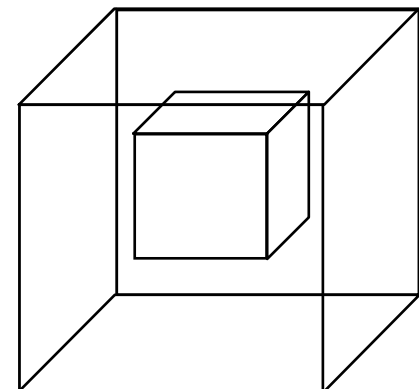
Product Mgr. View



Regional Mgr. View



Financial Mgr. View



Ad Hoc View



Cubes Defined

- **Definition:**
- **Cubes are collections of measures. They are a logical way to organize data. All measures in a cube share the same dimensionality**
- **Examples:**
 - ☐ **Sales_Cube (with Units, Dollars, Profit)**
 - ☐ **Finance_Cube (with Actual, Budget, Variance)**



What Are AW Cubes?

- **Data stored as arrays**
- **Dimension values are internally integers**
- **Offset calculated using simple multiplication**
- **Offset tells exactly where to look for data**
- **Pages and segmentation complicate design**
- **Conjoints and composites handle sparsity**

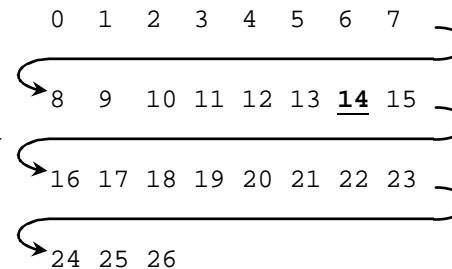
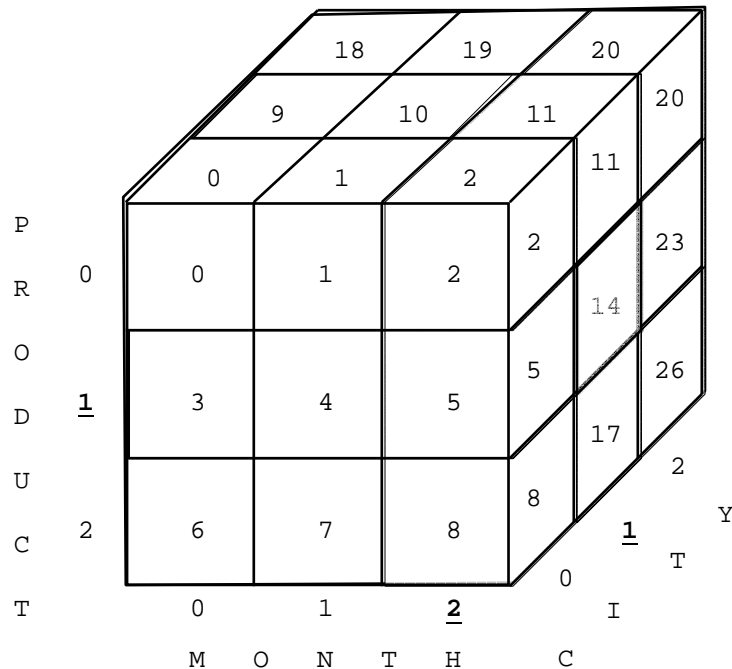


Finding data is simple multiplication and addition in an AW

Formula for calculating cell offset:

$$\text{month} + \text{product} * (\# \text{ of months}) + \text{city} * (\# \text{ of months} * \# \text{ of products}) = 14$$

2 + 1 * (3) + 1 * (3 * 3) = 14



Offset 14 * 8 bytes each = 112.

Fseek to byte 112 to find data.

See <http://www.vlami.com> for

"How Does Express Really Work Anyway" for details.



What is an Analytic Workspace?

Oracle Enterprise Manager Console

File Navigator Object Tools Configuration Help

ORACLE Enterprise Manager

GLOBAL

GLOBAL_AW

Tables

AW\$GLOBAL

Indexes

Materialized View

Partitions

Triggers

DATE_TAB

Indexes

Views

Synonyms

Sequences

Clusters

Source Types

User Types

HR

General Constraints Storage Options LOB Storage Statistics

Name: AW\$GLOBAL

Schema: GLOBAL_AW

Tablespace: GLOBAL_AW

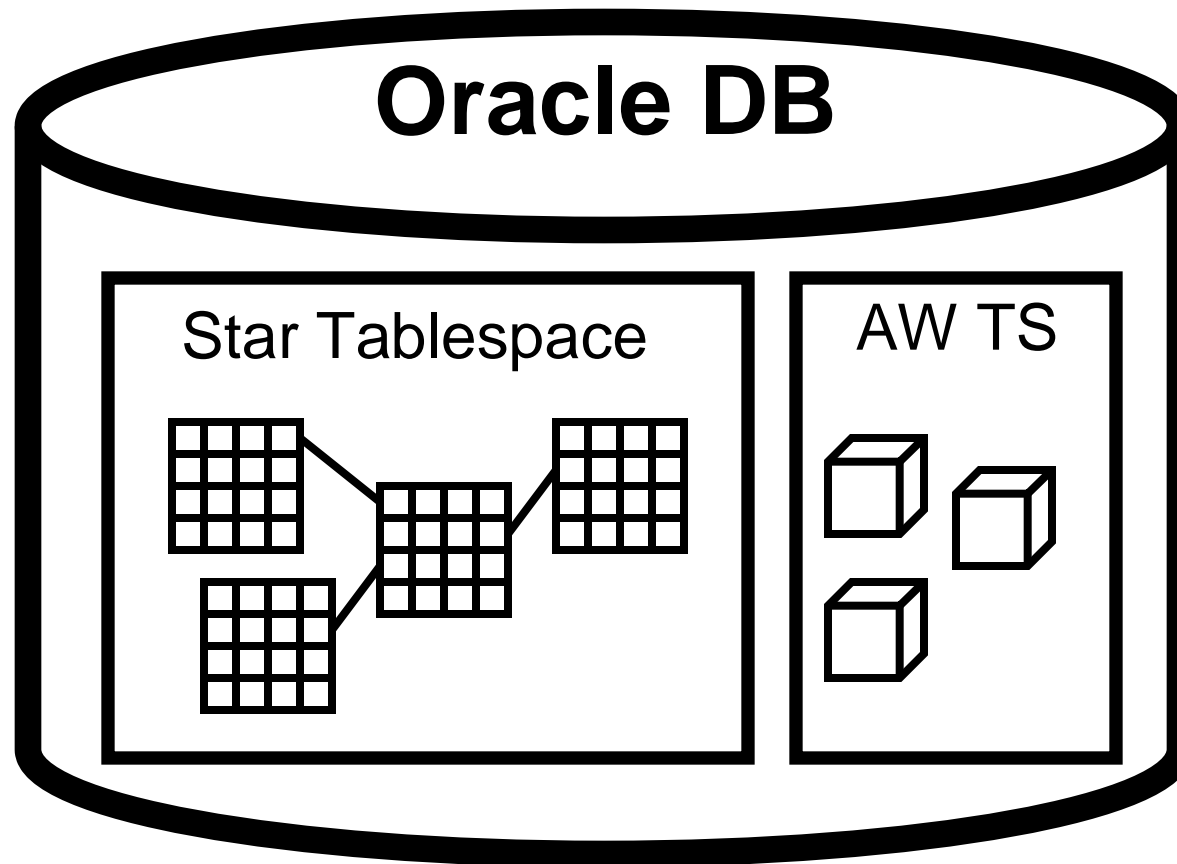
Table: ☒ Standard ☐ Organized Using Index (IOT)

Columns

Name	Datatype	Size	Scale	Nulls?
PS#	NUMBER	10	0	✓
GEN#	NUMBER	10	0	✓
EXTNUM	NUMBER	8	0	✓
AWLOB	BLOB			✓
OBJNAME	VARCHAR2	60		✓
PARTNAME	VARCHAR2	60		✓



Analytic Workspaces Are Stored in Tablespaces in OLAP





Managing Analytic Workspaces

Analytic Workspace Manager dantoshm2:1521:orcl Model View

File View Tools Help

GLOBAL
GLOBAL_AW
Analytic Workspaces
GLOBAL (attached RW)
Dimensions
CHANNEL
Levels
TOTAL_CH
CHANNEL
Hierarchies
Attributes
Mappings
CUSTOMER
PRODUCT
TIME
Cubes
SALES_CUBE
Measures
Calculated Mea
Mappings
PRICE_AND_COST
Measure Folders

Dimensions:

Name	Long Description	Type
CHANNEL	Channel	User
CUSTOMER	Customer	User
PRODUCT	Product	User
TIME	Time	Time

Cubes:

Name	Long Descri...	Dimensions
SALES_CUBE	Sales Cube	TIME,CUSTOMER,PRODUCT,CHANNEL
PRICE_AND_CO...	PRICE AND ...	TIME,PRODUCT

Measures:

Name	Cube
SALES	SALES_CUBE
UNITS	SALES_CUBE
BASE_COST	SALES_CUBE
COST	SALES_CUBE
BASE_PRICE	SALES_CUBE

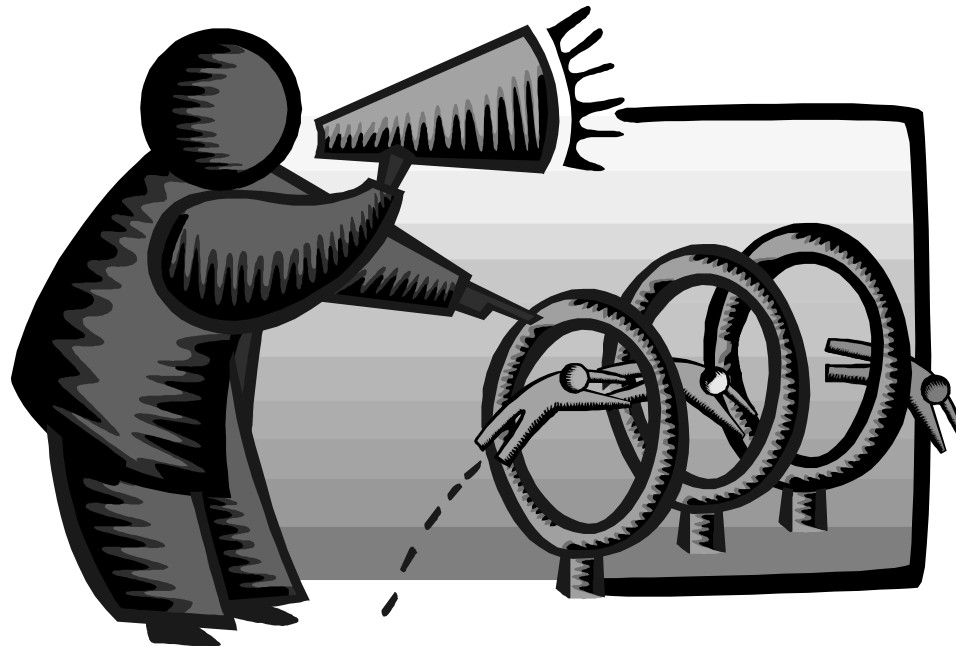


AWs Allow for Rules Based Apps

- **OLAP DML for manipulating data in DB**
- **Aggregation**
- **Allocation**
- **Decision Trees**
- **Transform data via complex OLAP DML logic**
- **High-power statistical functions built-in**
- **Rules or logic that differs by organization**
- **Expert systems**



Building Cubes in AWM



**See November / December 2005 Oracle Magazine
for 4-page article "Use Oracle AWM 10g to build
analytic workspaces" with details**



AWM Cube Builder Tips

- **Remember to save Everything to XML files**
- **Remember this is Realtime.... So changes are nearly immediate (may need to reload data)**
- **Use “View” to see results in tool – No Need for BI Beans to validate success!**
- **Move Measures to Folders**
- **Can save Calculated Measures to XML – Then you can Edit!**



Getting the Data Out

- **Once the Data is in OLAP how do we get the data out?**
- **Alternatives**
 - ☐ **BI Beans applications (Custom or pre-built)**
 - ☐ **Discoverer**
 - ☐ **Oracle Reports**
 - ☐ **SQL Access from any SQL tool**
 - ☐ **Spreadsheet Add-in**
 - ☐ **Any except Spreadsheet add-in can be in a portal and with web interface**
 - ☐ **Siebel Analytics**



Oracle BI New Product Stack

- **Oracle BI SE One (former Siebel)**
 - ❑ Announced March, 2006 – to be developed soon
- **Oracle BI SE**
 - ❑ Was OracleBI – Primarily Discoverer
- **Oracle BI EE Suite**
 - ❑ Announced March, 2006 – Available now, but repackaged Siebel
 - ❑ New release fall, 2006
 - ❑ Major release spring, 2007 incl. OLAP integration
- **Siebel Business Analytics Applications**

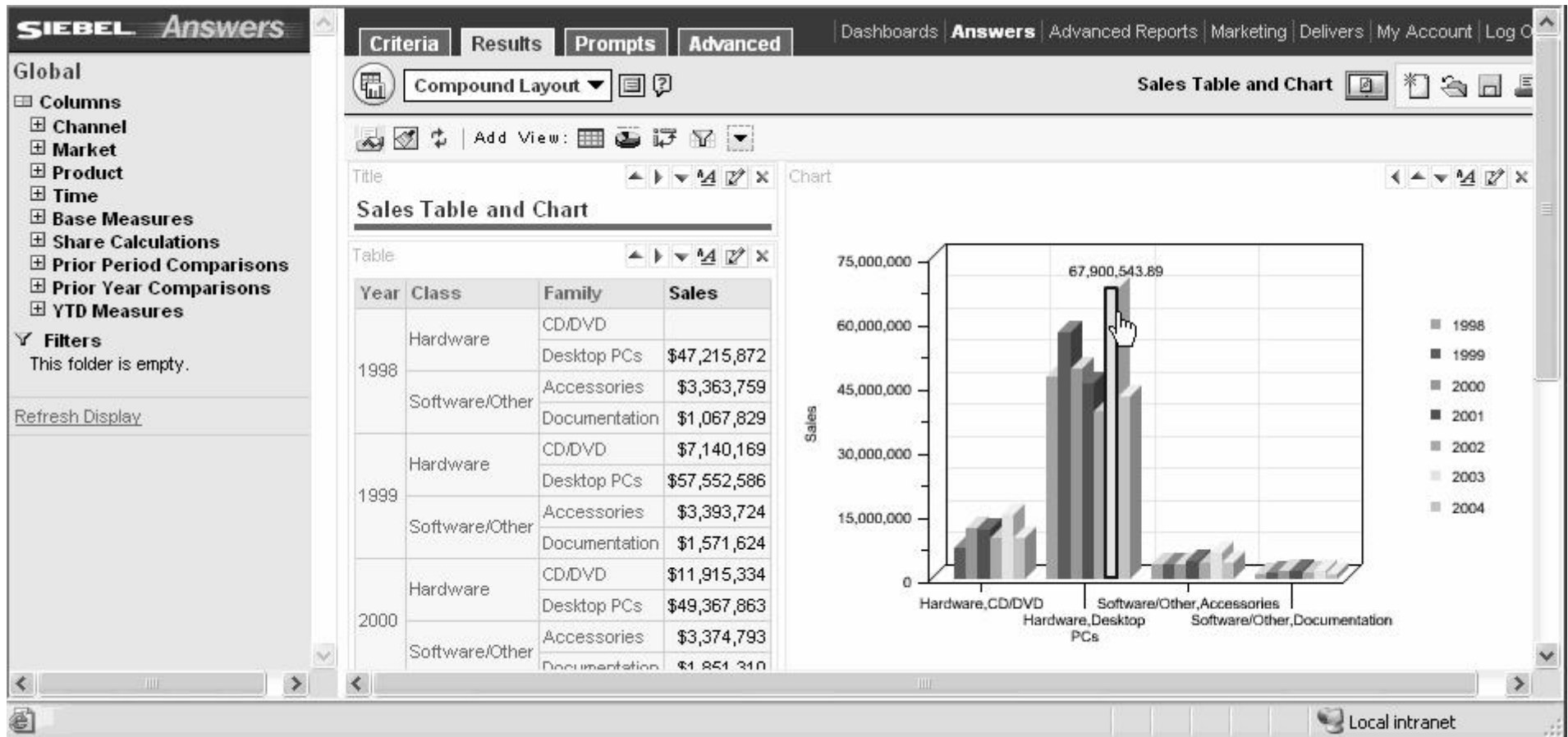


Oracle BI EE Suite Components

- **Oracle BI Server Enterprise Edition & Options:**
- **Oracle Business Intelligence Dashboard**
- **Oracle Business Intelligence Answers**
(ad hoc query and analysis)
- **Oracle Business Intelligence Delivers**
(proactive detection and alerts)
- **Oracle Business Intelligence Publisher**
- **The following available on named user basis:**
 - ☐ **Oracle BI Disconnected Analytics**
 - ☐ **Oracle BI Reporting Workbench**
 - ☐ **Oracle BI Server Administration**



Oracle BI EE Siebel Answers





Oracle OLAP Case 1

- **Manufacturing company needs to reduce inventory levels**
- **Uses OLAP DML Forecast command based on orders**
- **Users can override forecasts and add their own promotional campaigns**
- **Computes more accurate forecasts of production needs, reducing inventory levels**
- **Can compare accuracy of monthly forecasts by comparing various “scenarios” each month with actual shipments**
- **Application presented as JSP for business forecasters / managers**



Oracle OLAP Case 2

- **Service organization with call center wants to minimize hold time but not increase headcount**
- **Solution is to analyze hold time and customer resolution time for each support analyst**
- **Can rank support engineers / departments by customer satisfaction / resolution / callback rates**
- **Can pay bonus based on quantifiable results**



Oracle OLAP Case 3

- **Oil company has complex GL and existing Express-based “business rules engine” for allocating costs and income**
- **Uses Oracle OLAP engine to develop models to allocate data based on rules analysts develop**
- **Users can develop their own way of analyzing the data rather than relying on IT**
- **IT sets up infrastructure, users develop actual analyses**



Oracle OLAP Case 3 (continued)

- **Company has existing Express application that meets user needs, but wants to modernize U/I and run with web interface**
- **Export/import existing Express databases to Oracle OLAP AWs**
- **Back-end code works as-is**
- **Front-end code rewritten in Oracle OLAP Web Agent (OLAP DML)**
- **"Application Generator" allows business users to create entirely new applications with their own multi-dimensional objects**



Oracle OLAP Case 4

- **Manufacturer wants an ad-hoc analysis and reporting against sales data warehouse**
- **Users need easy-to-use interface and limited custom analysis capabilities**
- **Front-end is BI Beans custom JSP with cross-tabs customized for user needs**
- **"Custom selector" allows users to select data**
- **Highlights importance of "returns"**
- **Daily data allows managers to impact EOM numbers**
- **Company changing business practices now**



Oracle OLAP Case 5

- **CPG company has existing Oracle Sales Analyzer implementation**
- **Company wants to explore using OracleBI to update technology**
- **Created Proof-of-concept dimensional model in less than 40 hours**
- **Demonstrated two techniques:**
 - ☐ **Export out data and import into Oracle OLAP**
 - ☐ **Use AWM to map to star schema data warehouse**
- **Company evaluating Discoverer OLAP**



Oracle OLAP Case 6

- **Shipping company wants to flexibly report data with many custom calculations**
- **Company used to multidimensional tools, but wants solution integrated with Oracle**
- **Many users accustomed to Excel**
- **Company wants training, but ends up needing consulting to get going**
- **Company now creating cubes on their own, using Excel add-in as their front-end of choice**



Oracle OLAP Case 7

- **Financial analysis company wants to analyze stocks against benchmarks using proprietary models**
- **Presentation of data is by various attributes of Equities such as Market Capitalization, Industry, etc.**
- **Users want to drill from groups of stocks to individual equities, changing dimensionality**
- **Custom OLAP DML code transforms data with models when copying from one cube to another**



Oracle OLAP Case 8

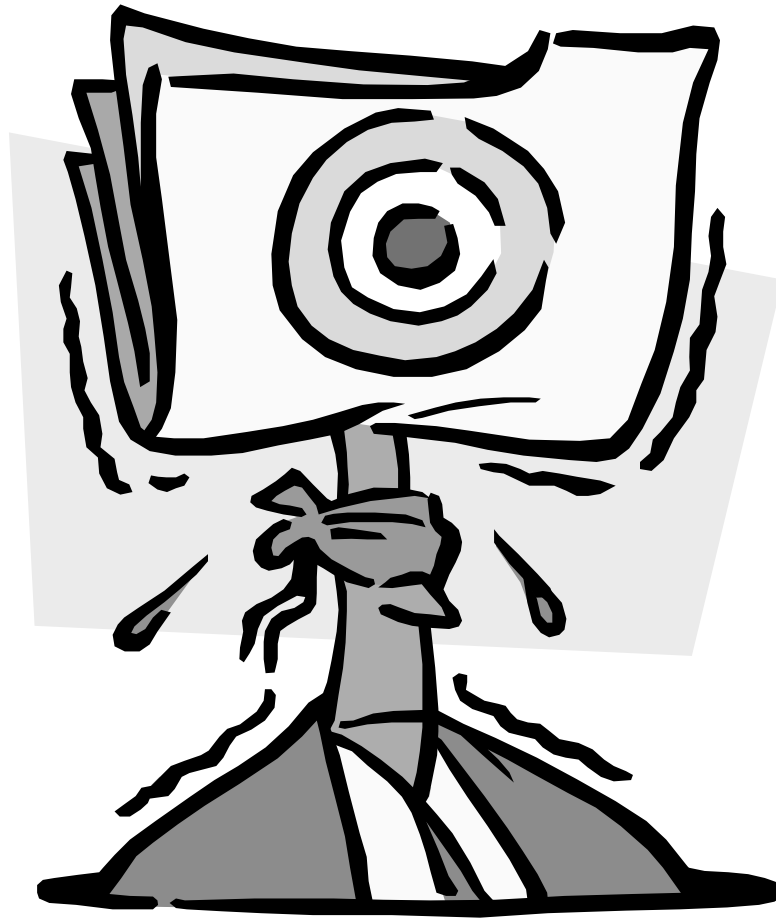
- **ASP Company using Oracle OLAP to deliver analysis of web traffic to clients**
- **Building separate AW for each client**
- **Uses templates to share common "dimensions" across multiple implementations**
- **Each client gets separate AW so each can customize dimensional model to their needs**
- **Building ASP offering around Oracle BI/OLAP**



OLAP Design Tips

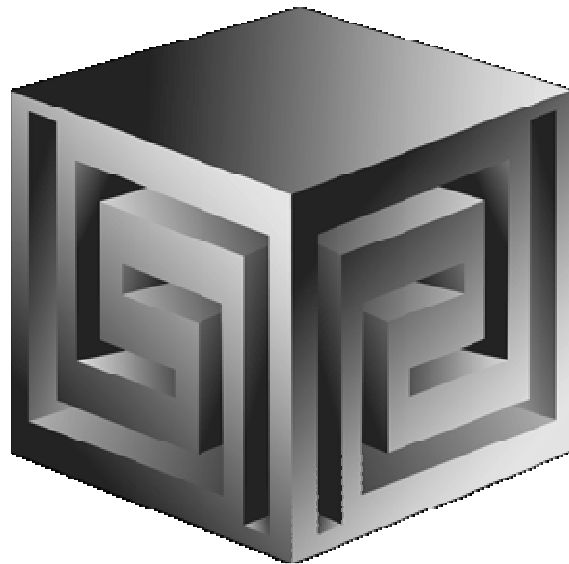
- **Eliminate duplicate keys across levels yourself (e.g. Terr 5 vs. Division 5) by concatenating level-based text in ETL**
- **Can use remote DB link to grab data from other versions of Oracle**
- **Use true "keys" for data so users can save presentations across DB loads**
- **Avoid creating "too many" (>7?) dimensions
– problems in presenting data from technical and user perspective**

QUESTIONS?



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