Investment Research and Portfolio Management Analytics using Oracle OLAP
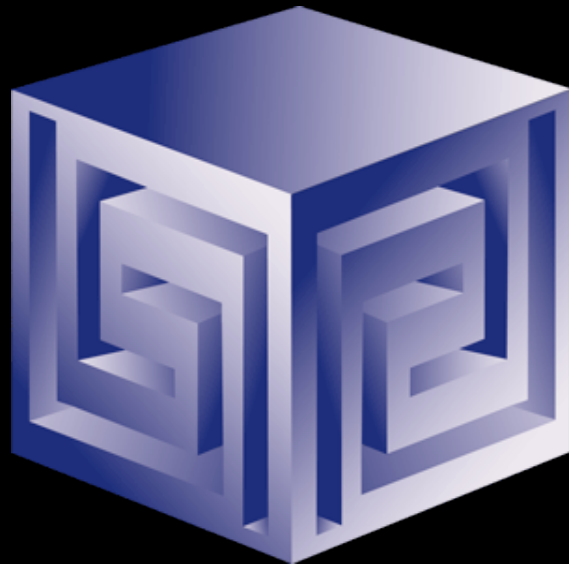
Collaborate '08

Session 223

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Mesirow Advanced Strategies

- **One of the Oldest and Largest hedge fund of fund managers in World**

- **Manages more than $16 billion in client assets**

Vlamis 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 we are?

- ## Peeyush Shukla, CFA, FRM
  - ❑ Vice President, and Head of Information systems at MAS.
  - ❑ MBA in Finance and Strategy from the Kellogg School of Management at the Northwestern University.
  - ❑ Architected solutions, and managed large-scale projects in the areas of Investment Research, Portfolio Management, Trading, and Risk Management at various Financial Services institutions prior to joining MAS.

- ## Chris Claterbos, Consulting Manager
  - ❑ Consulting and Development Manager for Vlamis Software Solutions, Inc.
  - ❑ DBA and applications developer for Oracle products, since 1981.
  - ❑ Beta tester and early adopter of - including Oracle 8i, 9i, 10g and 11g, JDeveloper and BIBeans, Oracle AS, Portal , and Reports.
  - ❑ Speaker and author.
  - ❑ Previous IOUG Focus Area Manager for Data Warehousing and BI

Outline

- **Introduction**
- **Business Case**
- **Oracle BI Overview**
- **Technical Solution**
- **Architecture Overview**
- **Backend Analytics**
- **Front-End Development**
- **Demonstration**
- **Tips and Issues**
- **Conclusion**
- **Questions**

Goals for new OLAP Applications

- Ability to look at the universe of data in many ways

- Obtain Answers quickly no matter how unpredictable the search pattern

- Have an integrated solution of both data and front-end tools

- Provide a framework from which to build additional applications
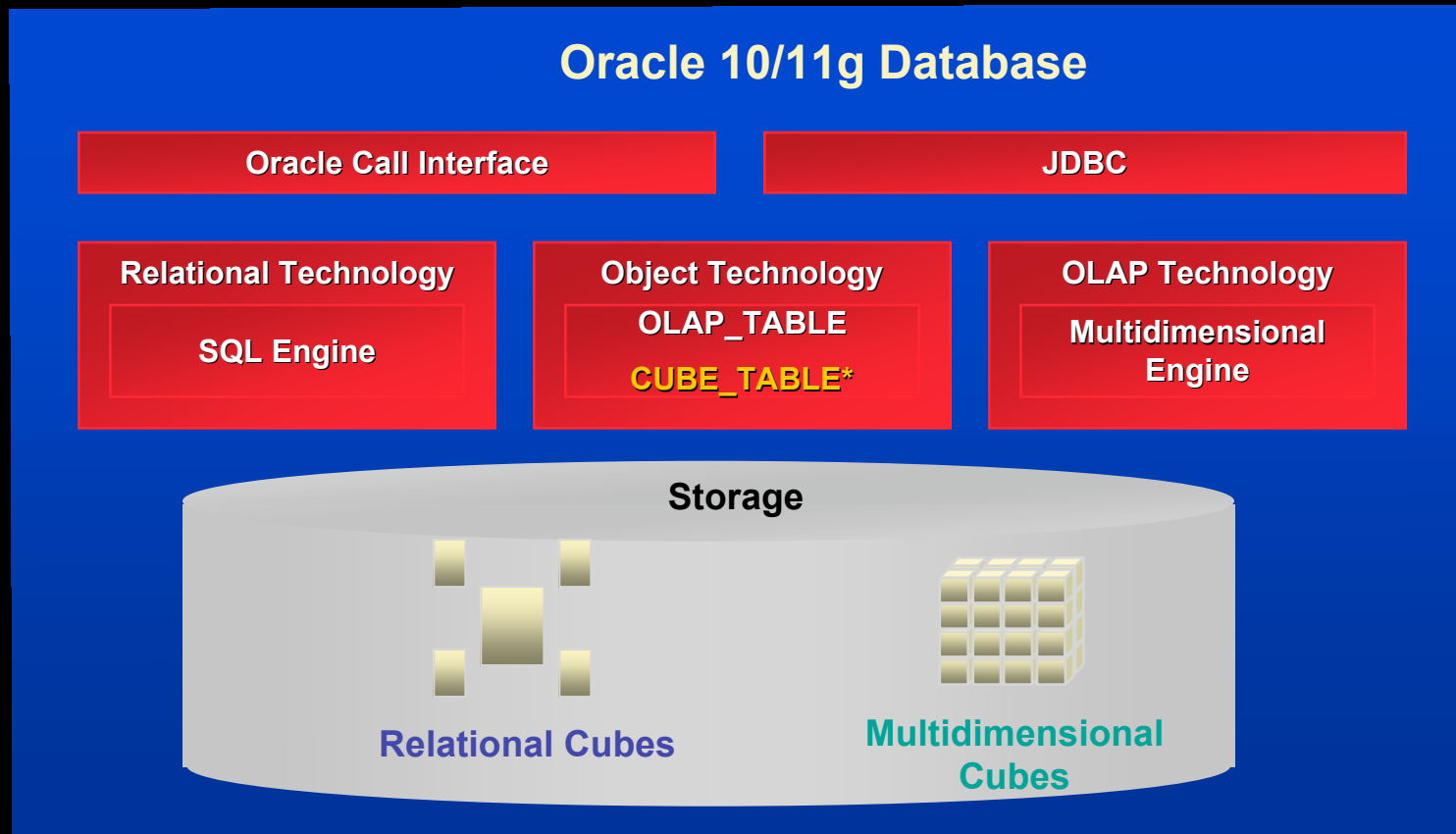
- Replace existing Matlab and Excel-based applications

Mosaic Suite Implementation

- **Use Oracle Technologies for Solution**
  - ❏ Oracle 10g Rdbms with OLAP Option
  - ❏ Oracle Warehouse Builder
  - ❏ Oracle Application Server
  - ❏ Oracle Jdeveloper and BI Beans

- **Provides ability to slice and dice universe of Equities, Corporate Bonds, Managers, and MAS proprietary measures along several key dimensions of interest**

- **Integrates relational data and multidimensional cubes in a single platform**

- **Leverages the power of Oracle's relational and multidimensional technologies**

- **Java Framework for extensible application development and deployment**

Oracle RDBMS - MDDS

Oracle 10/11g Database

Oracle Call Interface	JDBC

Relational Technology

SQL Engine

Object Technology

OLAP_TABLE

CUBE_TABLE*

OLAP Technology

Multidimensional Engine

Storage

Relational Cubes

Multidimensional Cubes

Technology Selected

- **Oracle 10g EE 10.2.0.3**
- **Oracle OLAP**
- **Oracle Warehouse Builder 10g**
- **Oracle Business Intelligence SE**
- **Oracle Jdeveloper 10g**
- **Oracle BI Beans**

What Does Oracle OLAP Add?

- 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

- What-if, forecasting

- OLAP Cube can replace Materialized Views (11g)

Building the Data Warehouse

- Early on modeled in Erwin

- Star or Snowflake schema designed in Oracle Warehouse Builder

- dimension tables (level-based)

- Each child has single parent (no many-to-many)

- Total level at top of each dimension (except Time?)

- TIME dimension built using Time Wizard

- Fact tables have additive measures

OLAP Design

- Used Oracle Analytic Workspace Manager (OWB not fully functional at the time)
- 16 Dimensions
- Multiple Cubes created, broken out by common application or dimensionality
- Used Measure Folders to group measures by application
- Specialized aggregation methods used for some measures
- Complex formulas created manually
- OLAP DML programs used for consolidation and complex aggregations

Mosaic OLAP Model
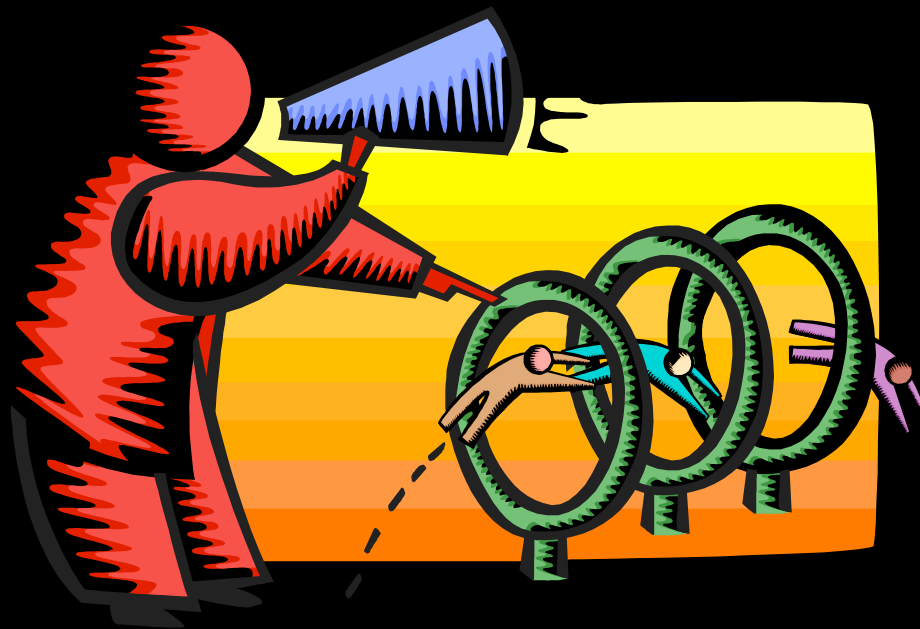
Front-End Design Considerations

- Needed to be Thin Client, zero footprint

- Needed to have a custom look and feel

- Oracle JDeveloper and BI Beans chosen for development environment

- User interface required complex selection criteria. Dictated the development of custom Java controls

- Close integration between front-end and back-end data status required.

- Not everything was provided "Out of the Box"

Mosaic Application

- **Example view of Mosaic App**
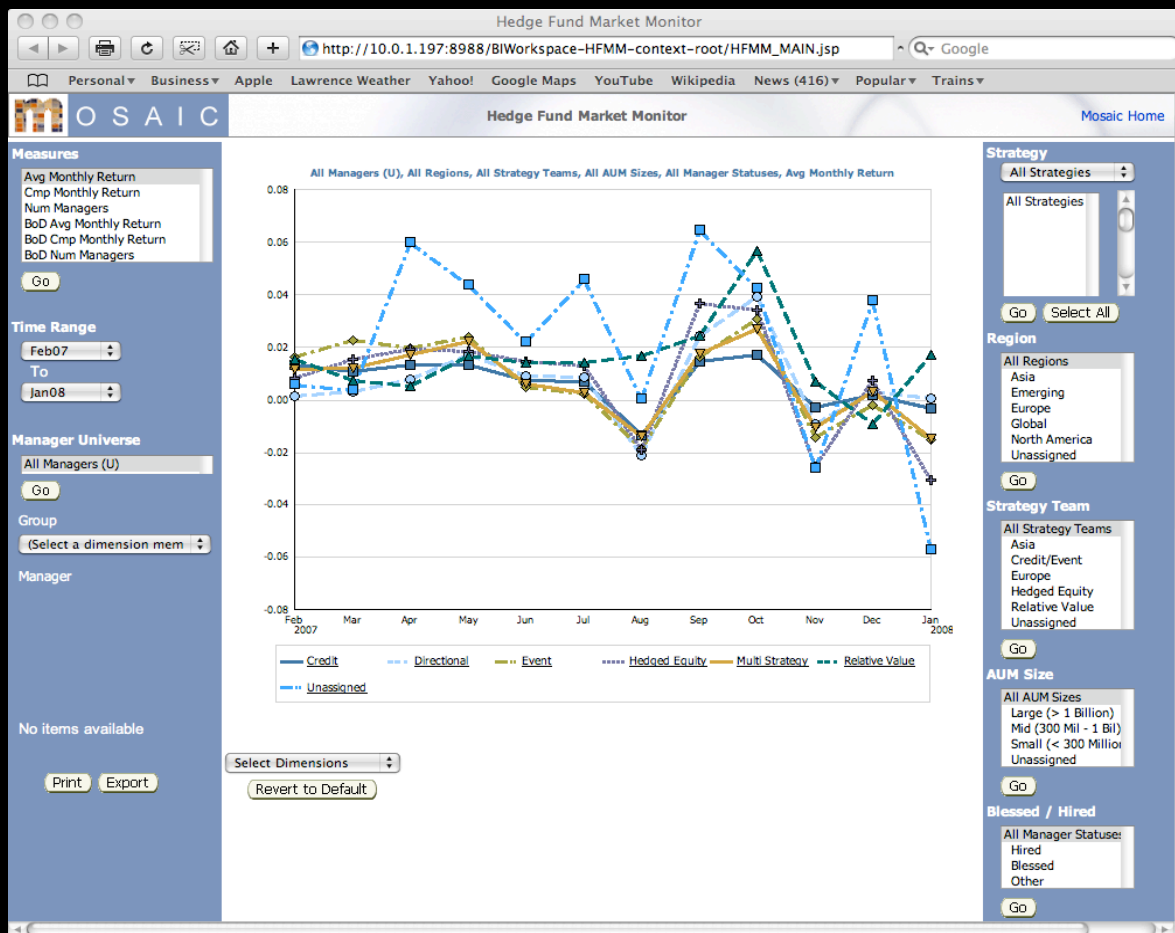
Challenges

- **Front-End settings needed to sync with back-end data**
- **Needed New Selector Widgets**
  - ❑ **Date Range Tool**
  - ❑ **Level Tool**
- **Custom Rotations**
- **Needed to show and hide selectors**

Sync with Backend

Functions Needed:

- ❑ Setting of backend variables used in measure formulas
- ❑ Limit data in backend to improve performance

Issues / Solution:

- BI Beans had no native way to sync

- BI Tags provided not extensive enough to satisfy requirements

- Custom Java code written to communicate front-end status to backend.

Custom Widgets

BI Beans BI Tags did not provide all of the required selector tools

- **Date Range Tool**

- **Level Selector Tool (cascade list not appropriate here)**

Other Customizations

- **Ability to hide and display selectors based upon which measure was chosen**

- **Hard coding of dimension rotations in lieu of using generalized tools**

- **Custom Drill Events to display Relational Reports based upon dimension member status**
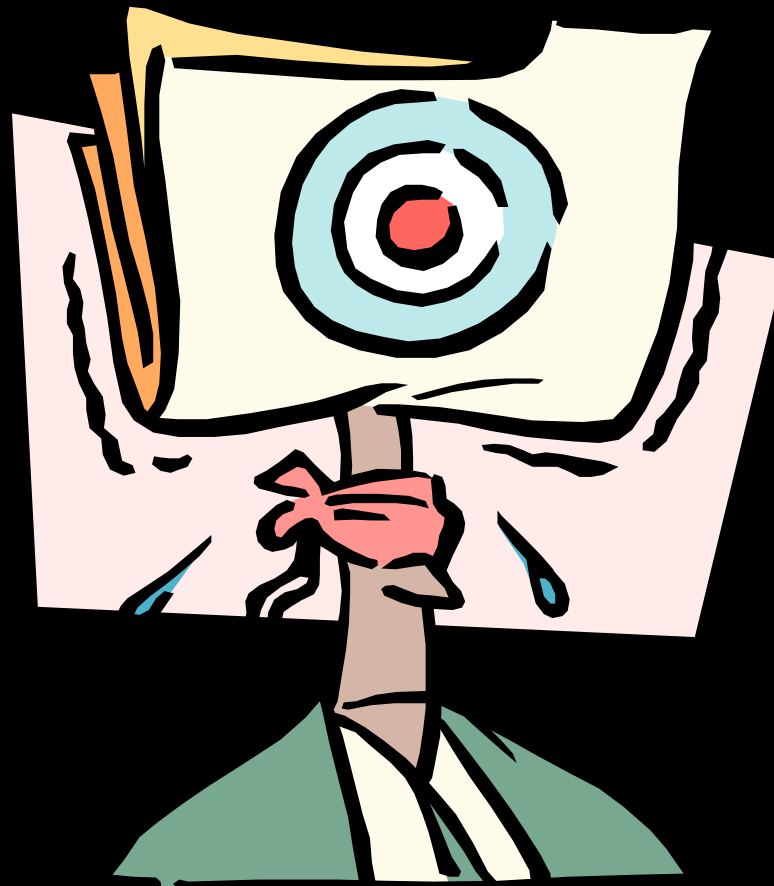
Front-End Demonstration
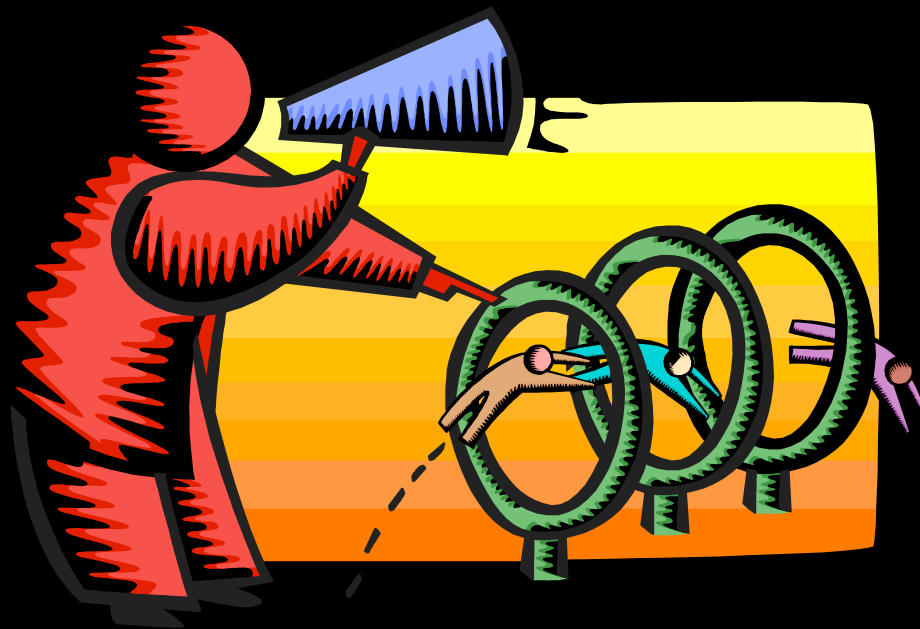
Conclusions

- **Oracle Technology provided extremely flexible powerful analytic solution**

- **Power to analyze large amounts of data quickly**

- **Rapid response regardless of how the data is sliced and diced**

- **Support for complex sophisticated queries**

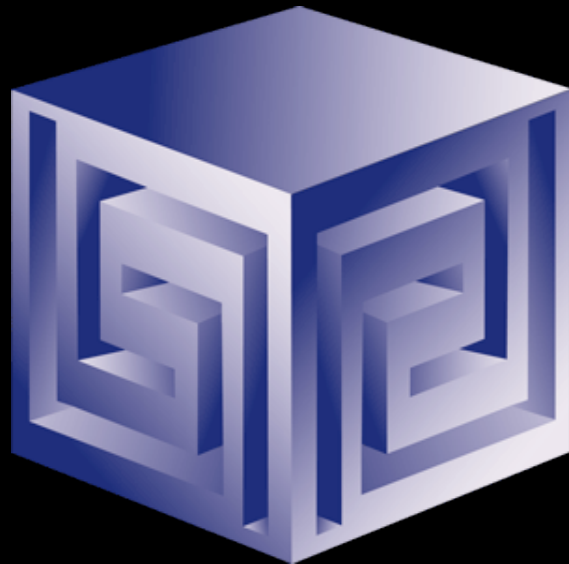- **Front-end easy to use and extensible in the future**

QUESTIONS?

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