

Using Business Intelligence with Oracle's E-Business Suite

Paper # 89

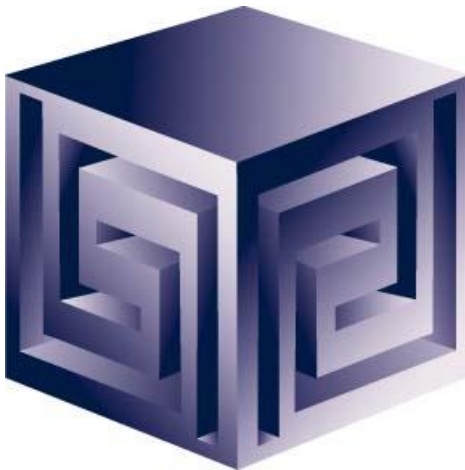
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Vlami Software Solutions, Inc.

- **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 Vlami is former developer at Oracle-Waltham office for Sales Analyzer Application**
- **Oracle Certified Solutions Provider**

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Agenda

- **What BI Is**
- **What BI Is Not**
- **Terminology and Marketplace**
- **Assessing Data Warehouse Readiness**
- **Oracle's Business Intelligence Tools**
- **Oracle Sales Analyzer**
- **Oracle Financial Analyzer**
- **Questions**



What BI Is

“Knowledge workers in an organization need to be able to access relevant, comprehensive information and use analysis tools to make better business decisions that will help the organization gain a competitive advantage. This is Business Intelligence.”



What BI Is Not

“Business Intelligence is not one single application or one company’s set of applications. Instead, BI is the culmination of all of the systems an organization uses to supply its users with business information for making decisions. A data mart or data warehouse might be a part of the BI solution, but is usually not the whole of the solution.”



BI Terminology

- **Business Intelligence (BI)**
- **On-Line Analytical Process (OLAP)**
- **Decision Support System (DSS)**
- **Data Mart**
- **Data Warehouse**



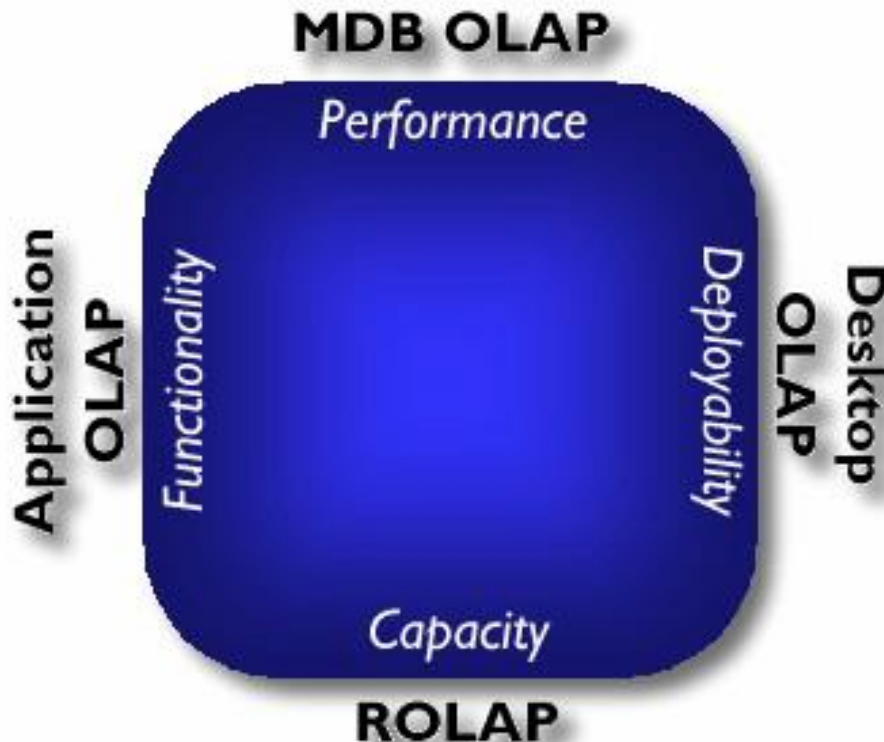
What is OLAP?

- **On Line Analytical Processing Tool**
- **Aggregate data**
- **Iterative discovery process**
- **Analysis of data warehouses**
- **Visual multi-dimensional tables or graphs**
- **Market historically broken into ROLAP, MOLAP, DOLAP**

Market Segment Analysis

The Olap Report

www.olapreport.com/segments.htm



“Based on the many criteria discussed in The OLAP Report, a potential buyer should create a shortlist of OLAP vendors for detailed consideration that fall largely into a single one of the four categories. There is something wrong with a shortlist that includes products from opposite sides of the square.”

Nigel Pendse



Relational Reporting

- **Advantages**
 - Lowest Cost Per Seat
 - Rich Formatting
 - Web deployable
- **Disadvantages**
 - No real analysis
 - Not interactive
 - Hard to manipulate for end users
 - Not really OLAP
- **Major Players**
 - Crystal Reports
 - BI/Query
 - IQ/Objects
 - Cognos (Impromptu)



DOLAP (Desktop)

- **Advantages**
 - Low Cost Per Seat
 - Easiest to Deploy
 - End User Friendly
 - Transactional Data
- **Disadvantages**
 - Limited Functionality
 - Limited Data Capacity
 - Limited Customization
- **Major Players**
 - Cognos (PowerPlay)
 - Business Objects
 - Brio
 - Oracle (Discoverer)



ROLAP (Relational)

- **Advantages**
 - Deal with Large Data Volumes (Terabytes)
 - Access via SQL
 - Read-Only Reporting
- **Disadvantages**
 - Slow Performance
 - Limited Financial Calculations
- **Major Players**
 - MicroStrategy (DSS)
 - Informix (MetaCube)
 - MindShare
 - WhiteLight



MOLAP (Multidimensional)

- **Advantages**
 - High Performance Database
 - Sophisticated Functionality
 - Supports Multiple Third Party Tools
 - Supports Gigabytes
- **Disadvantages**
 - Proprietary Language
- **Major Players**
 - MS OLAP Services
 - Hyperion/Arbor (Essbase)
 - Applix (TM1)
 - Seagate (Holos)
 - Oracle (Express)



Application OLAP

- **Advantages**
 - Integrated Application with Database
 - Out-of-Box Complete Toolkit
 - High Functionality
 - Some can be configured as Hybrid OLAP (HOLAP)
- **Disadvantages**
 - Complexity
 - Cost Per User
- **Major Players**
 - Oracle (OFA & OSA)
 - Hyperion/Arbor (Essbase)
 - Information Builders (WorldMart)
 - SAS



On-Line Analytical Processing

“Instead of a small number of analysts spending 100 percent of their time analyzing data,

all managers and professionals will spend 10 percent of their time analyzing the data themselves.”

- Gartner Group



OLTP versus OLAP/BI

OLTP

- Transactional data
- Detail data
- Heavy Read/write
- Focus on entering data
- Basic reporting

OLAP/BI

- Summary data
- Aggregate
- Access Read/only
- Focus on reading data
- Analysis



OLTP versus OLAP/BI

- OLAP/BI is ***iterative*** in modeling, design, and implementation
- Frequent exposure of unknown data quality problems
- Multiple source systems (OLTP) converge into one or more target (DW/OLAP/BI) systems
- Multiple lines of business use different business rules, assumptions, terminology
- Quantity of data that will reside in DW/OLAP/BI is typically unknown
- Difficulties in loading and aggregating data
- Different challenges in performance tuning



Why a Separate OLAP Tool?

- Empowers end-users to do own analysis
- Frees up IS backlog of report requests
- Ease of use—easy selection of data
- Drill-down
- Limited or no knowledge of SQL or tables required
- Exception Analysis
- Variance Analysis
- Easy rotation
- Formula calculations
- Aggregate data



What Is A Data Mart or Data Warehouse?

Data Warehouse

- **Capture Data That Will Help a Company Answer Questions About the Entire Business**
- **Uses Dimensional Modeling To Establish Structure – Star Schema**
- **Unlike OLTP, Answer Questions About the Process Not the Transaction**

Data Mart

- **Similar to Data Warehouse**
- **But, Focused on One Business Process**



Assessing Data Warehouse/BI Readiness

- **Strong Business Management Sponsor**
- **Business Vision**
- **IS/Business Partnership**
- **Current Analytic Culture**
- **Feasibility**

--Ralph Kimball, The Data Warehouse Lifecycle Toolkit



The Process

- **Everyone Needs To Be Part of Process – End-users, IS, & Management**
- **Identify the Business Process That Needs Questions Answered**
- **Establish Evaluation and Review Teams**
 - **Two Primary Teams - Decision Team and Management Review Committee**
- **Remove Politics**
- **Identify a Selection Methodology**
- **Design the Solution**

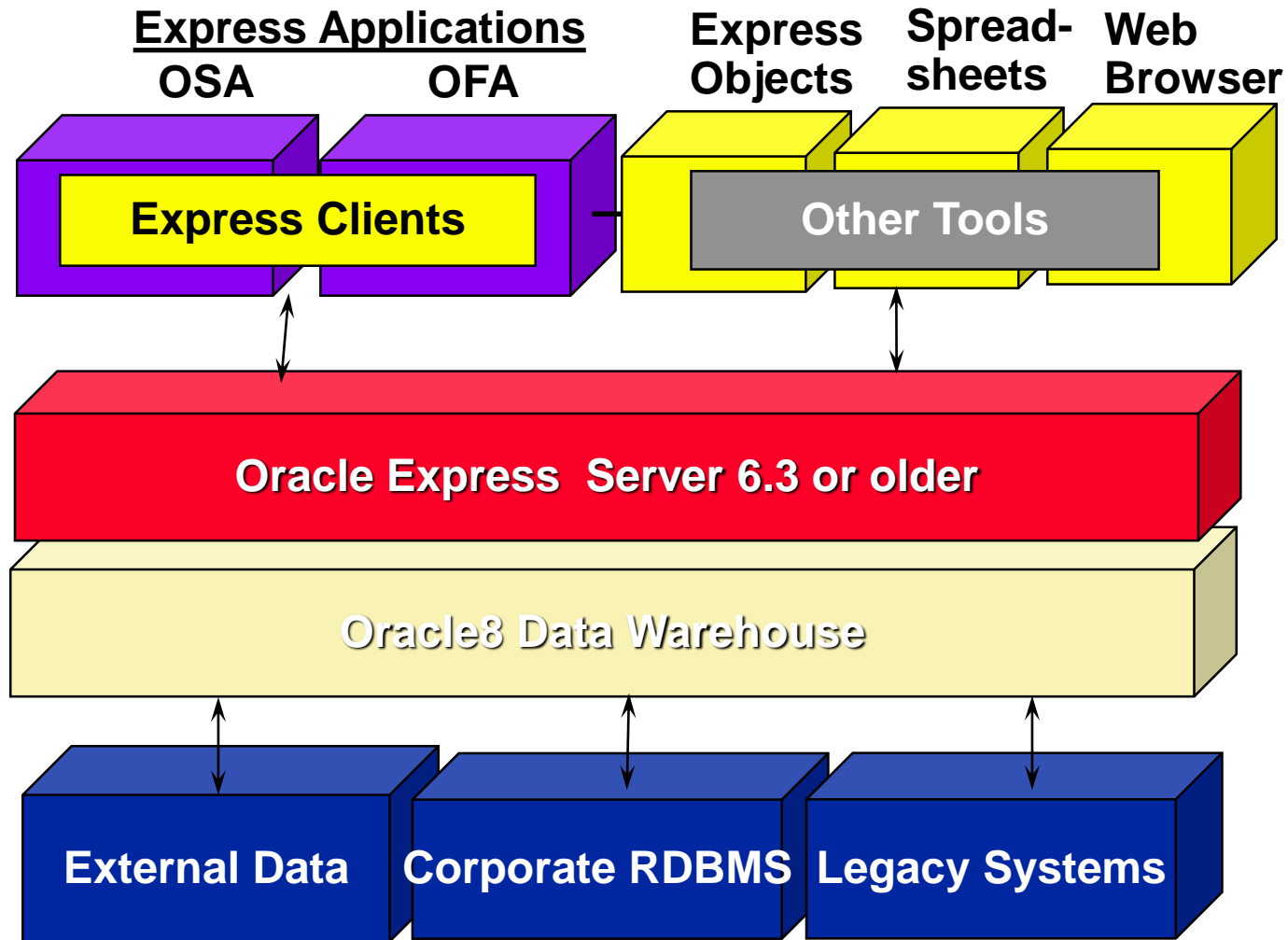


Oracle Business Intelligence

Products	Descriptions
Oracle Express Server	The Express Engine
Oracle Express Objects (OEO)	Object oriented development environment for building applications
Oracle Express Analyzer	Ad-hoc user tool for analysis and reporting of Express database data
Discoverer	Ad-hoc user tool for data analysis
Reports	Report writing tool
Oracle Sales Analyzer (OSA)	Pre-built sales/marketing analysis application
Oracle Financial Analyzer (OFA)	Pre-built financial analysis application



Express Product Architecture





Express Server

- **Database Engine Maintains Data Used by Oracle's BI tools**
- **Multidimensional Database**
- **Efficient For Maintaining and Analyzing Data**
- **Uses Dimensions and Hierarchies.**
- **Capability to Drill-down and Pivot Dimensions**
- **Has a Specialized Procedural Language**
- **Requires Custom Developed Applications or Pre-built Applications to Read the Data.**



Why a Multidimensional DB?

Advantages of Express DB

- ☐ Better access to multidimensional problems
- ☐ Better than relational for OLAP problems
- ☐ MOLAP provides fast access to data
- ☐ Empowers users to do their own analysis
- ☐ Pre-aggregated data or aggregate on the fly



RDBMS vs. MDBMS

RDBMS

- Data in tables
- Row-oriented
- Index access
- Access via SQL
- Transient selection
- Handles terabytes

MDBMS

- Data in variables
- Array-oriented (“cubes”)
- Offset access
- Proprietary language
- Persistent selection
- Hundreds of Gigabytes



Express Advantages

- **Designed for Multidimensional data**
- **Powerful formula capability**
- **Dimension-based selection**
- **Application programmability (OEO)**
- **Multiple hierarchies in dimension**
- **Selection separate from reporting**



RDBMS Data Access

What regions increased Merlot sales over last month?

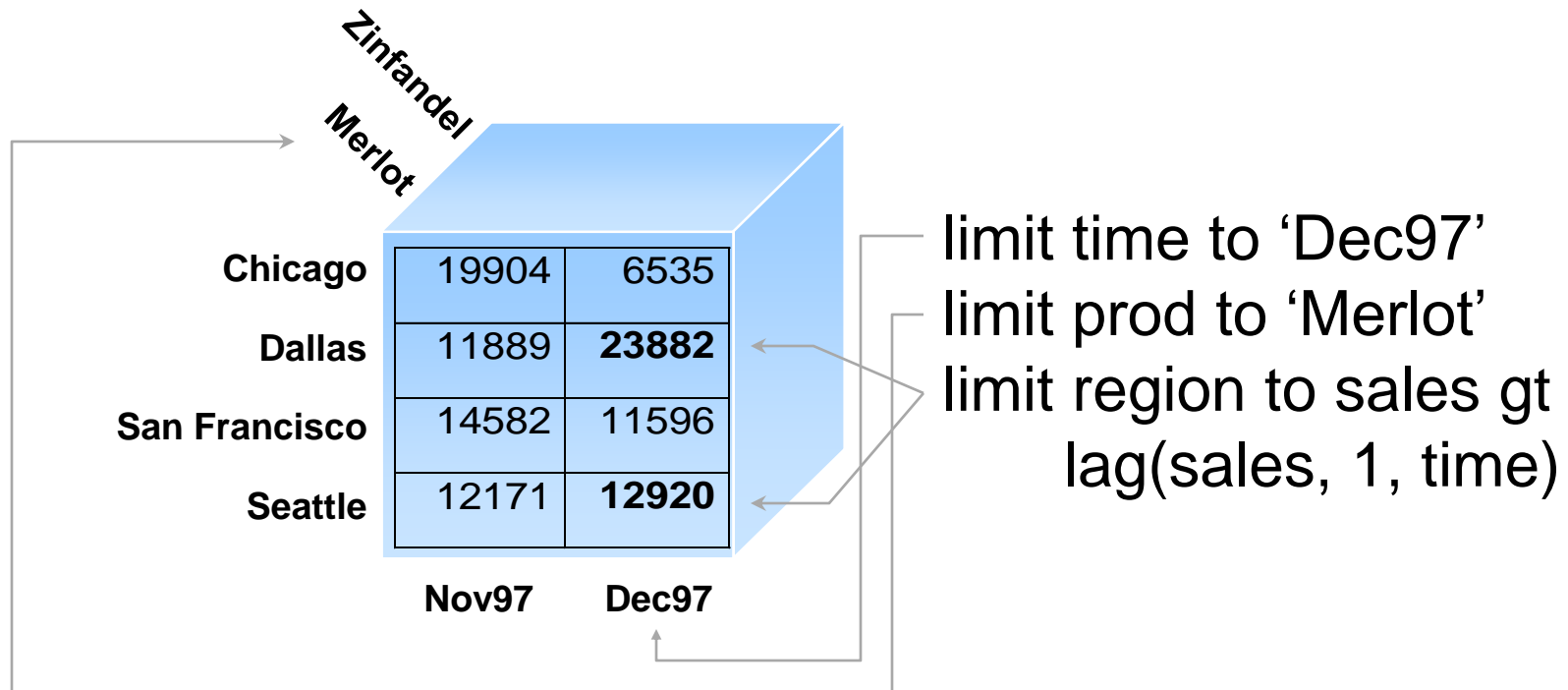
TIME	PROD	REGION	SALES
NOV97	Merlot	Chicago	19904
DEC97	Merlot	Chicago	6535
NOV97	Merlot	Dallas	11889
DEC97	Merlot	Dallas	23882
NOV97	Merlot	SF	14582
DEC97	Merlot	SF	11596
NOV97	Merlot	Seattle	12171
DEC97	Merlot	Seattle	12920

```
select time, prod, region, a.sales, b.sales
from salesdata a, salesdata b
where a.time = b.time + 1 and
      a.sales > b.sales and a.prod = 'Merlot'
```



MDBMS Data Access

What regions increased sales over last month?





Express Objects in Database

Express Objects: Structures that define an Express DB

- ☐ Dimension – index to variable data (who = product, geography, time, channel)
- ☐ Variable – arrays of data (what = sales dollars or units)
- ☐ Relation – simply a variable with a constrained domain
- ☐ Formulas – variable data calculated on the fly
- ☐ Programs – custom code
- ☐ Miscellaneous other types



Dimensions, Variables & Formulas

variables formula dimension dimension value

	MONTH					
	Jan97			Feb97		
	Sales	Units	Avg Price	Sales	Units	Avg Price
- World	8,769,594.00	11554	\$758.99	8,820,239.00	11626	\$758.68
- Americas	2,620,114.00	3202	\$818.36	2,654,537.00	3206	\$828.11
+ Canada	696,492.90	806	\$864.29	718,237.30	803	\$894.22
+ USA	1,553,282.00	1609	\$965.19	1,551,032.00	1614	\$961.21
+ Mexico	160,006.30	215	\$742.90	169,708.50	213	\$795.03
+ Argentina	58,284.48	363	\$160.56	58,540.31	370	\$158.11
+ Brazil	111,276.60	165	\$676.21	115,805.00	162	\$716.60
+ Colombia	40,770.59	44	\$935.96	41,213.54	43	\$949.27
+ Australia	740,387.00	944	\$784.47	759,259.10	958	\$792.91
+ Europe	3,773,573.00	5278	\$714.96	3,800,665.00	5322	\$714.13
+ Asia	1,635,521.00	2131	\$767.56	1,605,779.00	2141	\$750.14



Express Objects & Analyzer

Express Objects

- **Is an Object-oriented Tool**
- **Used to Create Custom Applications**
- **Sits on Top of the Express Server**
- **Has the Object-oriented Functionality: Inheritance, Encapsulation, and Polymorphism**

Express Analyzer

- **Used to Extend Applications Developed Using Express Objects**
- **Allows Users to Do Ad-hoc Analysis of the Data**

Unfortunately, these tools seem to be at the end of their life-cycle as Oracle tools and will not be fully supported in the future.



Express Analyzer Screen Shot

Oracle Express Analyzer - Xasample

File Edit Database Layout Window Help

Xasample

Ad Hoc Analysis Page 3 of 3

Ad Hoc Analysis Explain

Q2.96 All Channels

	World	Americas	Australia	Europe	Asia
- All Products	97.87%	97.89%	97.85%	97.87%	97.86%
+ Audio Div	97.99%	98.00%	97.93%	97.99%	97.99%
+ Video Div	97.74%	97.74%	97.74%	97.74%	97.72%
+ Accessory Div	97.67%	97.67%	97.68%	97.67%	97.67%

Q2.96 All Channels

Selector

Dimensions: Measure (1), **Geographical Area (5)**, Product (4), Time Period (1), Distribution Channel (3)

Geographical Area selection values:

- World
- Americas
- Australia
- Europe
- Asia

OK Cancel Help Custom... Library... Options...

Database Browser

XASAMPLE

Dimensions: Area, City, Continent, Day of the Month, Distribution Channel

Measures: % Chg Sales PeriodAgo, % Chg Sales YrAgo, **% Margin**, Actual \$ Financial, Area for each City

Start Exploring ... Exploring ... Control Pa... Dial-Up N... Inbox - MI... Microsoft ... Oracle ... Express ... 12:59 PM



Discoverer

- **Ad-hoc Query Tool Used to Analyze Data on the fly From Oracle's Relational Database**
- **Tightly integrated With Oracle's databases Which Simplifies:**
 - **Security**
 - **Scalability**
 - **Data Access**
 - **Metadata Creation**
- **Tight Integration With Oracle Reports, Oracle Applications Products, and Oracle Designer**
- **Uses Drill-down and Pivoting**
- **Disadvantage - Need For Users to Know Underlying DB**



Express and Discoverer Both Have

- **Tables and graphs**
- **Drag-and-drop rotation**
- **Drill-down/up**
- **Easy to use interface**
- **Cache data**
- **Conditional formatting (color-coding)**



Discoverer Advantages

- **Easier custom calculations**
- **More flexible reporting (subtotals, etc.)**
- **Operates directly against RDBMS**
- **Transactional view available**
- **Record-based selection**
- **More intuitive for users that know SQL**



Transaction Data in Discoverer

Oracle Discoverer - [todetail2.DIS]

File Edit View Sheet Format Tools Graph Window Help

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Winery Sales Transactions

INV ID	TIME DET	PROD DET	GEOG ID	ORDERDATE	SALES	SHIPVIA
689	14Jan-98	Merlot 1997	SanFran	05DEC97	17936.96	COMMON
690	15Jan-98	Merlot 1997	SanFran	06DEC97	3165.35	FEDEX
770	18Jan-98	Merlot 1998	SanFran	09DEC97	351.71	COMMON
769	24Jan-98	Merlot 1998	SanFran	15DEC97	1993.00	UPS
					Sum: 23447.02	

Sheet 5

For Help, press F1



Reports

- **Allows Users to Create Complex Reports from Oracle's Relational or Multidimensional Databases**
- **Unlimited Data Formatting and High-quality Presentation**
- **End-users Usually Only View the Reports**
- **Disadvantage - Developers May Need to Create the Complex Reports**



Oracle Sales Analyzer

- **Server-centric Approach for the Express Databases**
- **Read-only Application**
- **Ability for End-users to Create Custom Measures and Aggregates**
- **Ability to Deploy in Any OLAP Mode:**
 - ROLAP
 - MOLAP
 - HOLAP
- **Not Tightly Integrated with Any of the Modules of the E-Business Suite**

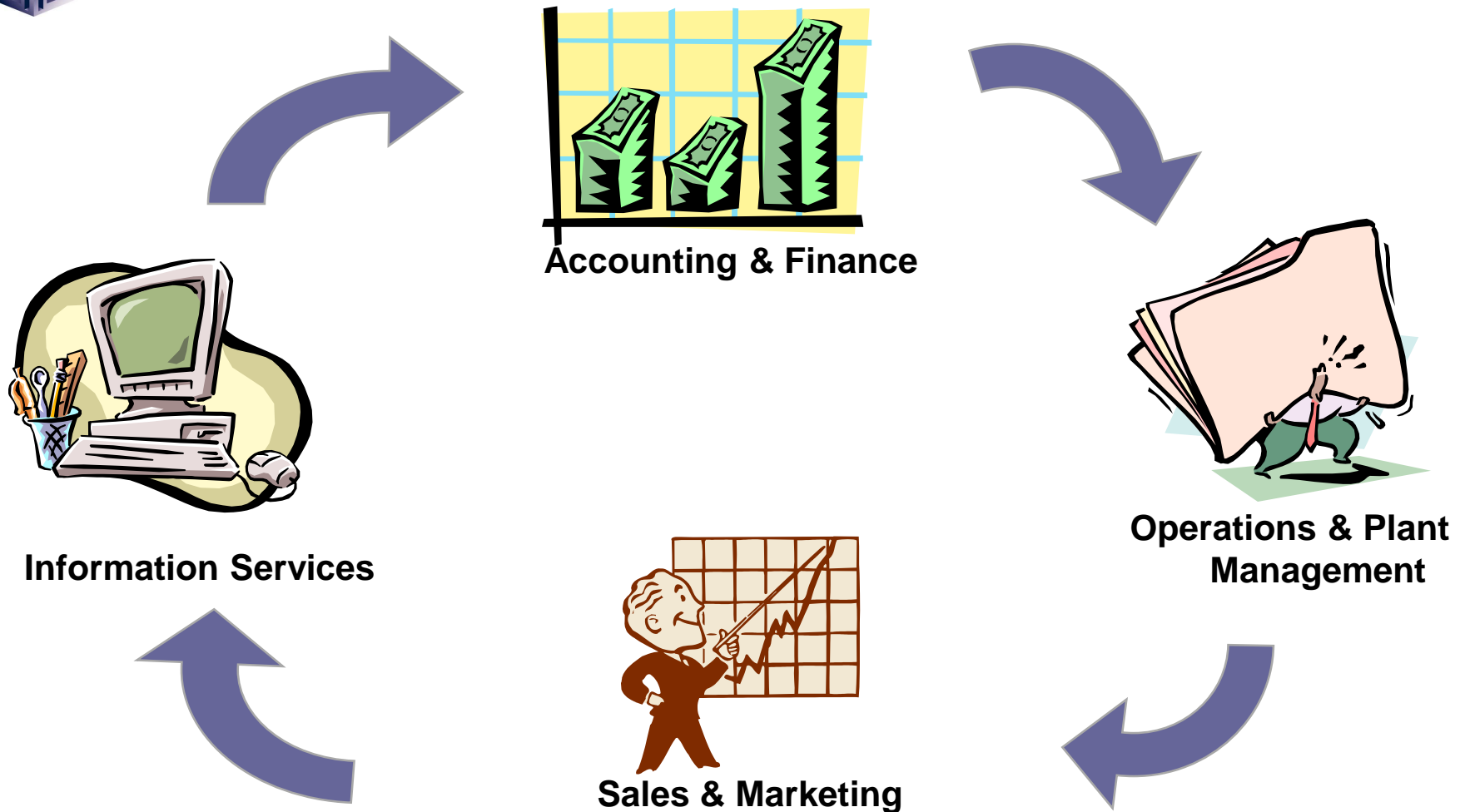


OSA Mini-Case Study – Company Background

- **Pioneer Worldwide is a diversified manufacturing and marketing company with emphasis in balloons serving the advertising, entertainment, decorating, and social expressions industries.**
- **10 subsidiary companies with 11 physical locations worldwide**
- **Doing business in 80+ countries with transactions in 8 different currencies**
- **Over 1,300 employees worldwide**



The Ongoing Cycle





Initial OSA Requirements

- **Replace and integrate Pioneer's separate Product Sales Analysis and Customer Sales Analysis tools**
- **Allow drill-down through all levels of customer and product hierarchies**
- **Plan for drill down to transactional data at some point in the future**
- **Allow exception reporting (e.g., top 25 customers of 11" balloons)**
- **Allow users to easily share reports with others**



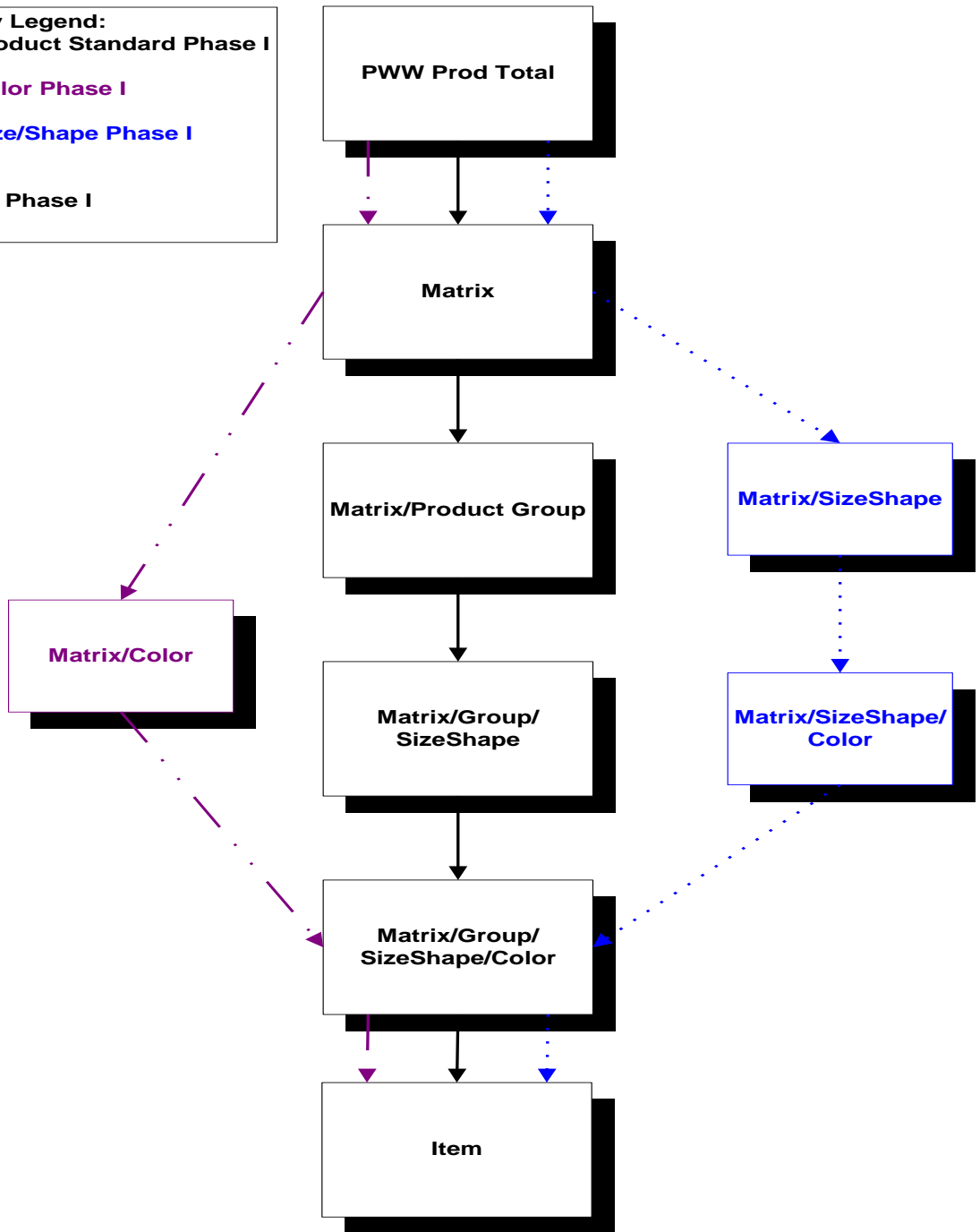
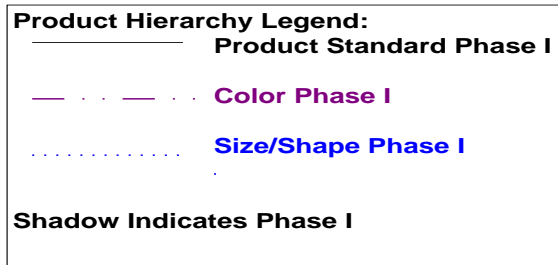
Initial OSA Requirements (continued)

- **Allow users to develop custom groups (aggregates) of customers, items, etc.**
- **Allow users to develop custom measures “on-the-fly”**
- **Easily graph the report data**
- **Allow users basic forecasting and “what-if” capabilities**
- **Allow users access via the web**
- **Allow Macintosh users access to the application**



Initial Business Requirements

- **A user-friendly sales and product analysis tool to help users:**
 - **Redirect marketing \$ to promote the most profitable products.**
 - **Analyze market profitability**
 - **Analyze territory and salesperson profitability**
 - **Identify slow moving products for liquidation**
 - **Analyze customer sales performance**
 - **Analyze effectiveness of sales/marketing promotions**





“GO LIVE”

- **General users were given two-hour training sessions in small groups with hands-on activities**
- **Pilot Users were utilized as training assistants and became a resource after the classroom training**
- **Detailed training manuals were provided that included screen shots**
- **Lotus Notes Feedback Database was opened up to all users for help, bug tracking, and enhancement requests.**



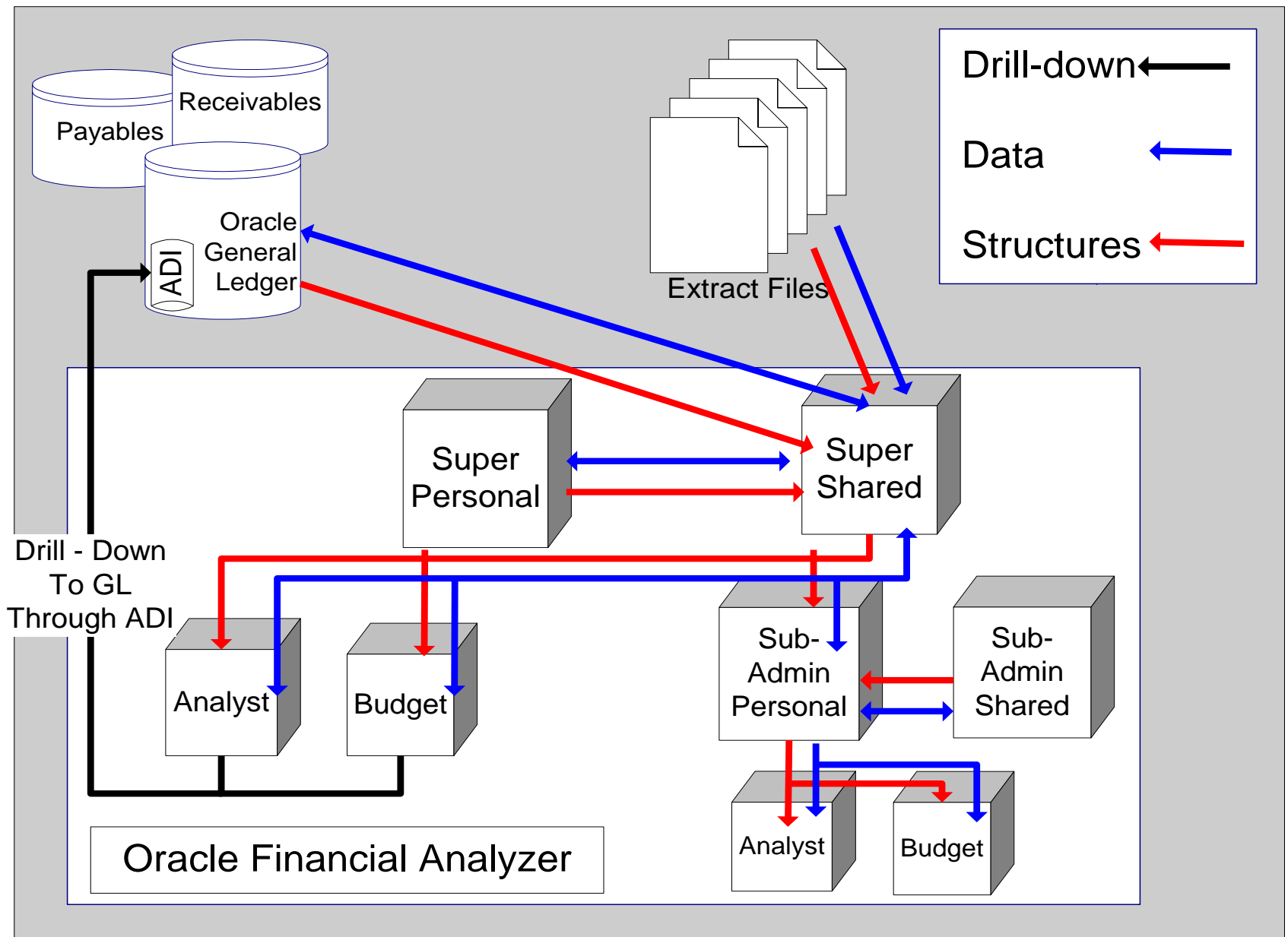
Conclusion

- **The success of the implementation can be attributed to:**
 - **Support from Executive level**
 - **Consultants with in-depth knowledge of the tool as well as Pioneer's business**
 - **Creative solutions quickly applied as problems arose**
 - **Pilot users that are readily available to assist others**
 - **Motivated end users**



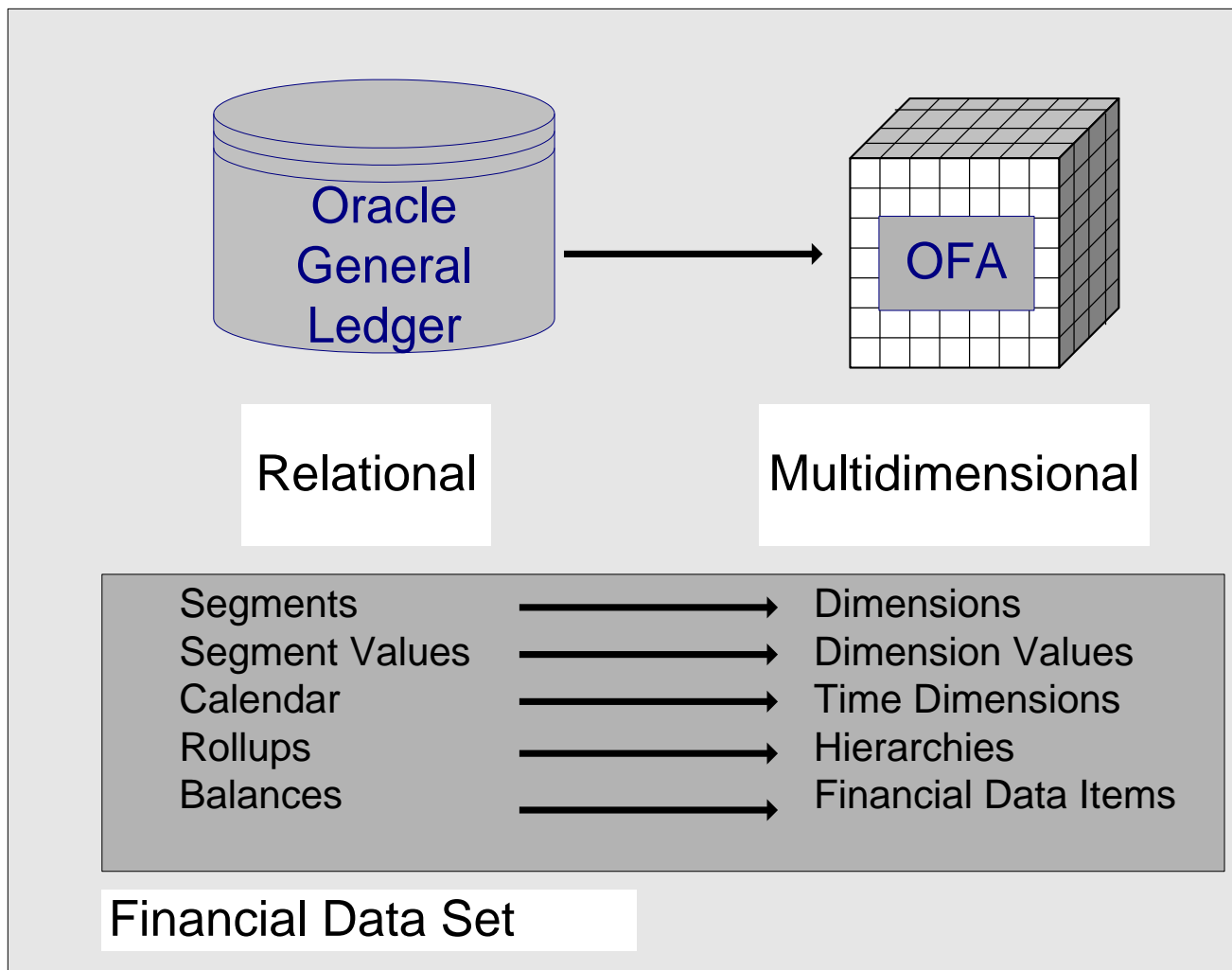
Oracle Financial Analyzer

- **Distributed Approach in Using Express**
- **Allows Users the Autonomy to Create and Manipulate Own Scenarios of Data**
- **Ability to Write Data Back**
 - **Budgets and Forecasts**
- **Ability to Create Asymmetric Reports**
- **Integrates OFA with the Oracle General Ledger from the E-Business Suite**
- **Custom Facts (FDIs), But Knowledge of Express Language Needed**





Oracle GL to OFA Mapping





OFA Integration With OGL

- **Is the Analysis and Planning Tool of Choice**
- **Use the GL Link to Load Data from OGL to OFA**
- **Map Structures from OGL Directly to OFA Structures Using Forms in OGL**
- **Can Alter Number of Segments Brought Over From OGL – Can Combine Segments**
- **Can Customize OFA and Use Other Non-OGL Sources**



OFA Extras

- **Analyze How Many Dimensions Are Really Needed**
- **Maintain Hierarchies in OGL, If Possible**
- **Use GL Link to Load Structures, But May Need to Write Custom Load for Data – Size Issue**
- **Use GL Link to Load Actuals, Custom Code to Take That Information and Load Into Other FDI In Order to Customize Structures**
- **Any Customization Would Require a Knowledgeable Express Resource**
- **Use Models to Create Balance Sheet or Income Statement If COA Not Capable, or need “ what if ” scenarios in budgeting or forecasting**



BI Implementation Suggestions

- **Pick single first department**
- **Decide on set of terminology at beginning**
- **Show instances in addition to "levels" in diagrams**
- **Prototype and design iteratively**
- **Pick small initial project. Deliver value quickly**
- **Involve users early on. Listen to feedback**
- **Develop in phases with milestones**



Required Skill Set for BI success

- **Extract, Transform, Load (ETL)**
 - Source data is heterogeneous
 - Referential integrity of data is questionable
 - Want to use outside market or purchased data in cube
- **Translating Business Needs into OLAP**
 - “Shifting Sands Vision”
 - End-users have unrealistic expectations
 - Internal goals include cultural change
 - Want decision making based on facts and figures
 - Build consensus



Required Skill Set for BI success

- **Design and Modeling experience**
 - Multidimensional model using variables, dimensions, hierarchies, attributes
 - Data mart and data warehousing load and query optimizations
 - Industry knowledge
 - Experience based Toolkit
- **Client front-end**
 - Multiple vendor front-end choices
 - Application building and gap filling
 - SPL complexities

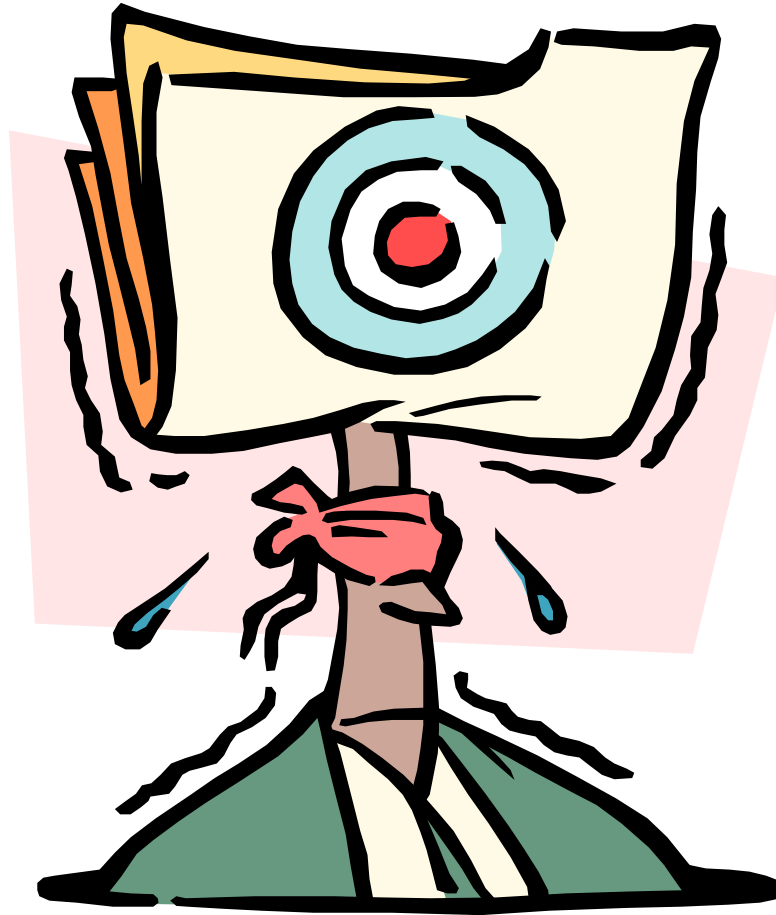


Putting it All Together – Keys to Success

- **Executive Sponsorship**
- *** Realistic Expectations**
- *** Methodology**
- *** Team**
- *** Proper technical architecture and tools**
- *** Quality data**
- *** Limited scope changes**
- **Fast payback projects**

***Note: Key areas where ETL tools and OLAP/BI consultants can add value.**

QUESTIONS?



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