IAF Business Intelligence Solutions

Make the Most of Your Business Intelligence

White Paper
November 2002

IAF Software

INTRODUCTION

In recent years, the amount of data in companies has increased dramatically as enterprise resource planning (ERP), customer relationship management (CRM), and supply chain management (SCM) systems take hold and log more and more transactional data. Most companies have tried to implement Data Warehouse and Business Intelligence (DW/BI) applications to pull data from these systems and analyze it in order to improve business performance but the systems have fallen short of expectations.

The main reason for the inability to effectively analyze and gain understanding from these vast pools of data is clear. The system environment is inflexible and cannot adjust to the constantly changing business needs driven by changes in the market, competitor strategies, and customer requests – just to name a few of the influences. Management is struggling with the seemingly contradictory goals of accommodating these needs while maintaining optimal control over the technology.

IAF Software's solutions, IAF Coaster™ and IAF Vista™, were developed to provide the flexibility required by the most demanding DW/BI applications. The Company's extensive experience gives it the insight needed to address both management's concerns regarding data and technology management, while empowering users by providing them with the tools needed to skillfully build analytic models – and most importantly – be able to change those models, when necessary, to accurately reflect changing conditions in their business environment.

TRADITIONAL OLAP DEVELOPMENT

Traditionally, OLAP systems have pulled data from a central data warehouse or other RDBMS and replicated it into a separate, standalone multidimensional database (MDBMS) to increase query performance and allow users to more easily analyze the data. While this architecture has succeeded in creating high-performance OLAP systems, there are several major drawbacks to this approach. First of all, MDBMS are expensive to implement and maintain, because of the extra hardware required and the additional data administrators, with specialized training, that must be hired to support it. The IT group that supports MDBMSs must constantly grapple with the following issues:

- ✓ There are two kinds of databases, RDBMS and MDBMS, that they have to learn and manage.
- ✓ To create the analytic models, DBAs have to either write code by hand for each ETL process (in SQL or a proprietary OLAP Server language) or they have to set up mapping paths from scratch to map logical analytic models to physical tables for each OLAP cube.
- ✓ When business users – a term we use to describe analysts, managers, executives and anyone who needs to interpret data as part of their job – want to change business models, DBAs have to change the dimension table in the corporate datawarehouse. For example, a business user wants to add a "Platinum" category to the current customer dimension which has three categories: "Gold," "Silver" and "Bronze." To accommodate this request, DBAs have to change the current customer dimension table or add a new customer dimension table.
- ✓ If changes are made in the dimension table, DBAs then have to change the ETL programs, or mapping specifications between the logical analytic models and the physical tables.

Figure 1 illustrates a typical traditional OLAP environment, with a separate, proprietary MDBMS:

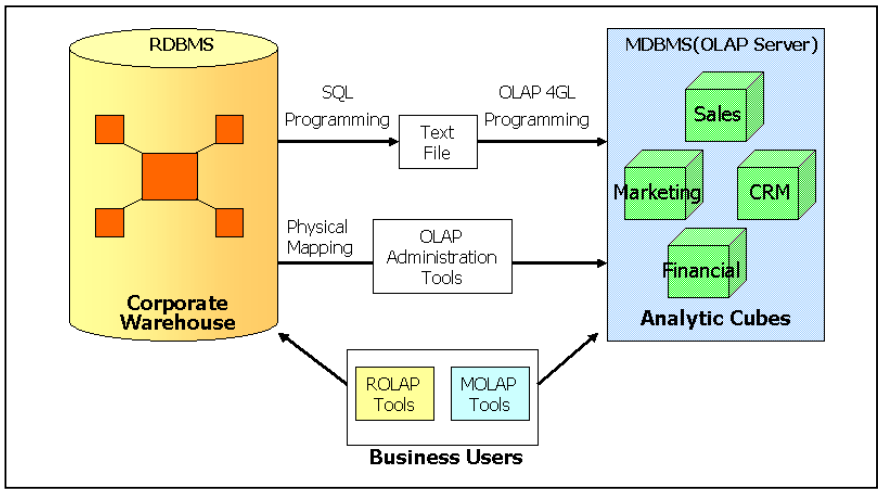

Figure 1: Traditional OLAP Development

OLAP DEVELOPMENT WITH AN INTEGRATED RDBMS-MDBMS

Recently, it has become possible to take advantage of the benefits of an MDBMS without replicating large amounts of data to specialized analytic databases. It is now possible to build an integrated RDBMS-MDBMS and allow applications to support multidimensional calculations directly against the data warehouse. There are many advantages to a fully-integrated RDBMS-MDBMS database – as compared to separate, stand-alone MDBMSs. These include:

- Simplified management
- High availability
- Improved security
- Open access to both SQL and OLAP API clients
- Reduced information cycle time
- Improved data reliability

At the same time, the advantages of having a powerful, dedicated OLAP server are retained, such as:

- Faster query performance
- Specialized OLAP functions
- The ability to visually analyze the data

As the world's largest enterprise software company and leading provider of relational databases for data warehouses, Oracle Corporation offers the best solution for an integrated RDBMS-MDBMS approach. Oracle9*i* Database now provides a comprehensive platform for BI applications. In addition to the benefits listed above, Oracle provides:

- A complete range of analytic functionality including multidimensional and predictive functions
- Support for Internet-based applications

Illustrated below is the Oracle database architecture, which includes the Oracle9*i* OLAP Services.

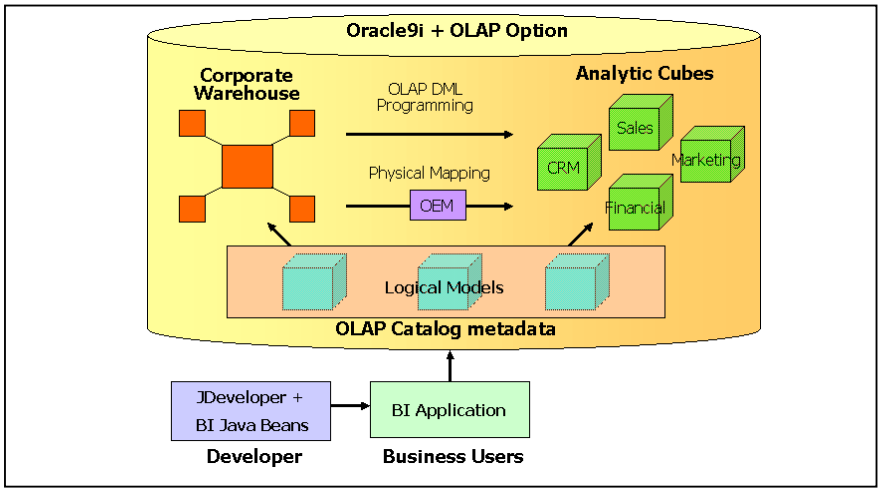

Figure 2: Oracle9i R2 OLAP

IAF SOLUTIONS EXTEND ORACLE9*i* OLAP

IAF Coaster and IAF Vista extend the Oracle9i OLAP environment and resolves the issues that limit traditional OLAP systems.

IAF Coaster

- ✓ Both relational and multidimensional data are stored in relational tables. This means that DBAs do not need to duplicate the data and learn proprietary OLAP server technologies.
- ✓ IAF Coaster manages the core elements of the analytic model, such as dimension, hierarchy and measure, as *parts* in its metadata repository. These elements are completely divided from the physical source so that modifying metadata for the specific change requested can be accomplished without affecting the underlying source data structure.
- ✓ The parts can be customized and reused. For instance, DBAs can copy the original customer dimension part, add a "Premium" virtual category, and move appropriate customers into the new "Premium" category. To exchange the current customer dimension and a new customer dimension, the new analytic cube is created without changing the dimension table in the source data warehouse.

IAF Vista

- ✓ A BI application development tool developed using Oracle JDeveloper and BI Beans. It enables business users to analyze the data as soon as an analytic model is built with IAF Coaster.

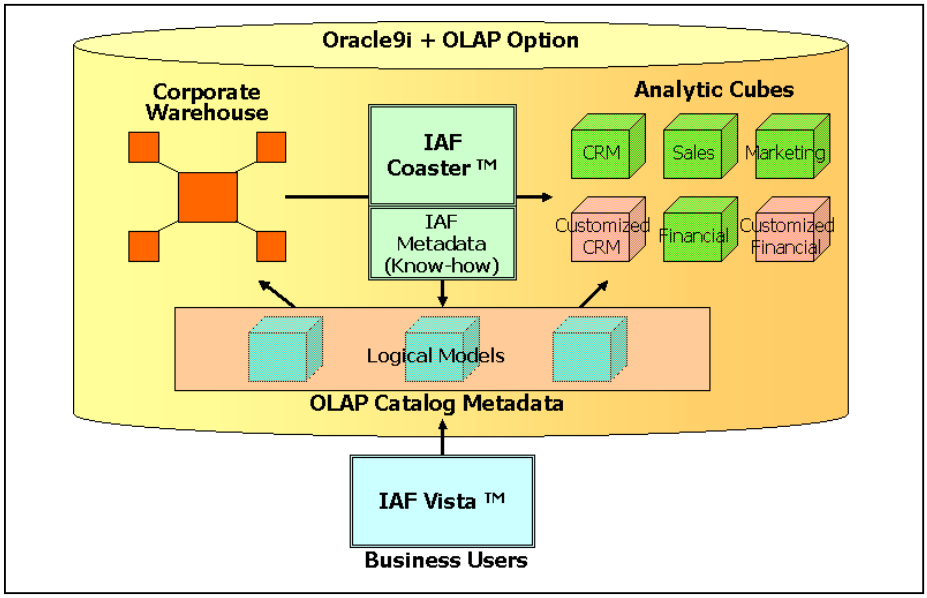

Figure 3: New Generation OLAP Development using IAF Coaster and IAF Vista

IAF COASTER™

IAF Coaster is an innovative metadata management tool, for Oracle 9i OLAP Services, that allows customers to create and manage their own analytic models without changing data structures in a corporate data warehouse. This unique solution helps speed the design and administration of OLAP analytic models by leveraging patent-pending technologies, such as flexible modeling features and powerful segmentation functions.

POWERFUL MODELING FUNCTIONS

Most OLAP tools provide basic advanced data presentation functions (e.g. 3-D graphics, pivot tables, crosstabs, 3D cubes), as well as advanced data aggregation, consolidation, and classification functions, including: slice and dice, drill down, and roll up data. IAF Coaster's business-oriented functions include the ability to calculate market share, sales margins, financial and accounting ratios, statistics and forecasting functions. In addition, advanced data modeling functions such as "what if" scenarios, variable assessments, and business models are easily executed with IAF Coaster.

VIRTUAL HIERARCHY

IAF Coaster enables a DBA or an analytic producer to customize hierarchy structures, as the need arises, without programming or dimension table changes in the data warehouse. This function is typically useful for the following types of analysis:

- **CRM** – Customer segmentation
- **Financial** – Organizational changes or changes in accounting practices
- **Sales** – Product category or sales territory changes

The virtual hierarchies are stored in the metadata repository, so that business users can share and reuse them as analytic know-how.

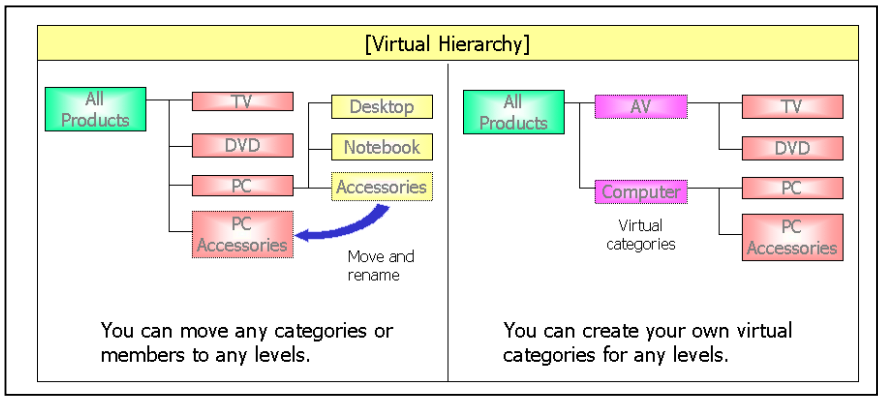

Figure 4: Virtual Hierarchy

VALUE-BASED SEGMENTATION

Value-based segmentation allows business users to specify value ranges for the dimension attributes in the metadata. As contrast, in traditional OLAP development, DBAs have to create a "price range" column in the product dimension table in advance in order for users to analyze price range data. The business users' work often requires range changes and they are frustrated when these changes cannot be done quickly. IAF Coaster allows DBAs to create the value-based segmentation in the metadata so that dimension tables do not have to be changed in the data warehouse.

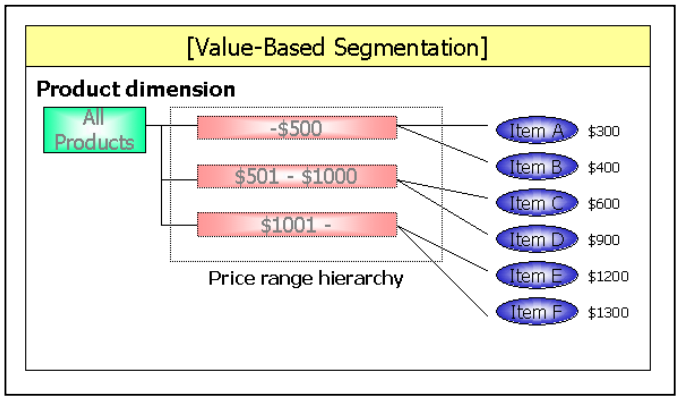

Figure 5: Value-Based Segmentation

PRE-DEFINED AND CUSTOM FORMULAS

Measure formulas are a combination of existing measures and calculation functions that are stored on the server. IAF Coaster has pre-defined measure formulas that are frequently used by business users, such as "last-year-sales." They are stored on the server and calculated by the OLAP engine when accessed. In addition to pre-defined measure formulas, IT staff or analytic producers can create custom measure formulas.

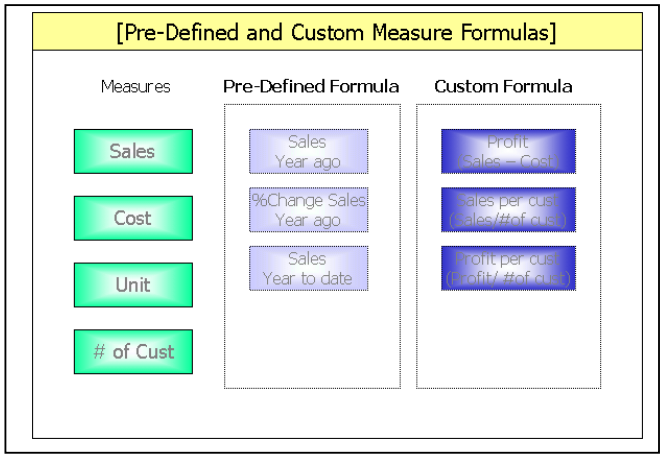

Figure 6: Pre-defined Formulas and Custom Formulas

MULTIPLE HIERARCHIES

In the Oracle OLAP option, one dimension is able to have multiple hierarchies so that business users can select the drill-path for each analytic viewpoint. Oracle DBAs can not only reduce disk space consumption, but can also improve pre-aggregation performance by not using separate dimensions. The following illustration represents the example of multiple hierarchies of product dimensions. This product dimension has two drill-paths, product category and product price range, that share the same top level and bottom level. However, if business users want to analyze the data by category and price range at the same time, DBAs should use separate dimensions. IAF Coaster enables DBAs to specify the multiple hierarchies easily.

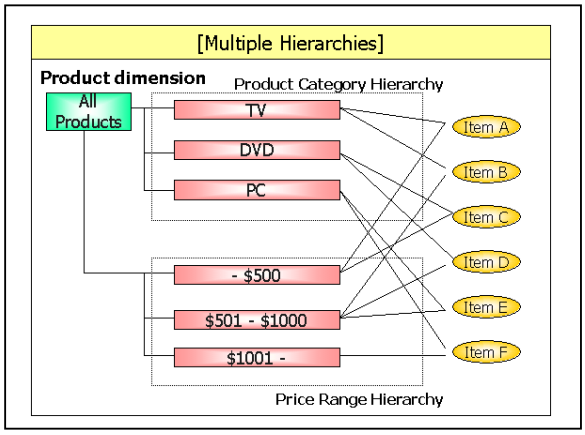

Figure 7: Multiple Hierarchies

BUILDING CUSTOM MODELS

A model is a set of interrelated equations. IAF Coaster includes a model function that allows users to easily set up a model of their own business. DBAs can perform calculations for individual dimension members by following unique calculation rules. The model function is very often used for Financial Analysis. The following illustration represents a *Profit and Loss* analysis. *Revenues* and *Operating Expenses* are calculated by aggregating the values of their lower level members, while *Operating Income* is calculated by subtracting *Operating Expenses* from *Revenues*. In traditional OLAP systems, DBAs have to write specific OLAP DML to implement that kind of model. IAF Coaster enables them to easily specify the DML from a GUI interface.

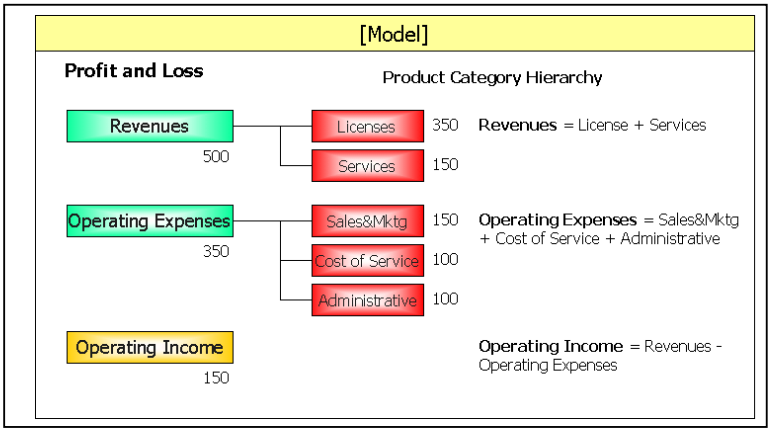

Figure 8: Model

USING IAF COASTER TO BUILD OLAP CUBES AND SIMPLIFY METADATA MANAGEMENT

IAF Coaster also offers powerful administrative features that greatly simplify the administration and maintenance of Oracle9*i* OLAP. Most importantly, with IAF Coaster, DBAs do not have to learn how to write code in OLAP DML or the OLAP Catalog API.

As background, to build and manage analytic cubes in Oracle9*i* OLAP, DBAs must learn two main processes. One is how to manage cubes in the Analytic Workspace, and the other is how to manage the OLAP Catalog. In Oracle9*i* OLAP, analytic cubes are stored in Analytic Workspaces in relational tables. To create the cubes, DBAs have to write OLAP DML that is similar in language characteristics to Oracle Express SPL. After creating the analytic cubes with OLAP DML, DBAs have to register the information in the OLAP Catalog (Common Warehouse Metadata) using the OLAP Catalog API, in other words CWM2 PL/SQL packages. These processes are the most complicated processes for Oracle DBAs to learn and write.

IAF Coaster generates not only OLAP DML, but also CWM2 packages automatically based on its metadata repository information. As soon as DBAs design the analytic models by using sophisticated modeling functions, they can implement these models in real cubes that will be accessible by business users. Using IAF Coaster simplifies the building of OLAP cubes and management of metadata, therefore saving time and effort.

IAF VISTA™

For a BI application to be truly effective, business users must be able to use BI tools on their own, without support from the IT staff or systems analysts. They must also be able to distribute their analysis results quickly and easily. Unfortunately, the more powerful OLAP tools that are available on the market today are difficult to use without IT support and are only offered as a client-server option. IAF Vista replaces difficult-to-use BI tools with a robust BI application platform that helps business users easily analyze corporate data and share it with any number of users via simple point-and-click web distribution.

OVERVIEW

IAF Vista is an easy-to-use BI application development and deployment environment that allows business users to easily create OLAP reports without support from corporate IT staff. IAF Vista replaces complex BI tools and enables business users to easily share data analysis know-how and company information.

Key features of IAF Vista include:

- An easy-to-use interface for both BI experts and novice users
  - Set up reports and perform analysis by simple point-and-click operations
  - Access via any Web browser (both HTML and Java client versions are available)
- Advanced OLAP analytic functions
  - Drill-down, pivot table, create graphs, data exception formats, etc.
- Publish reports via the Web
  - Store reports in the central data repository for access by other departments
  - Collaborate internally or with external supply-chain partners
- Leverage the power of Oracle9*i* OLAP Services
  - 3-tier for scalability and sharing

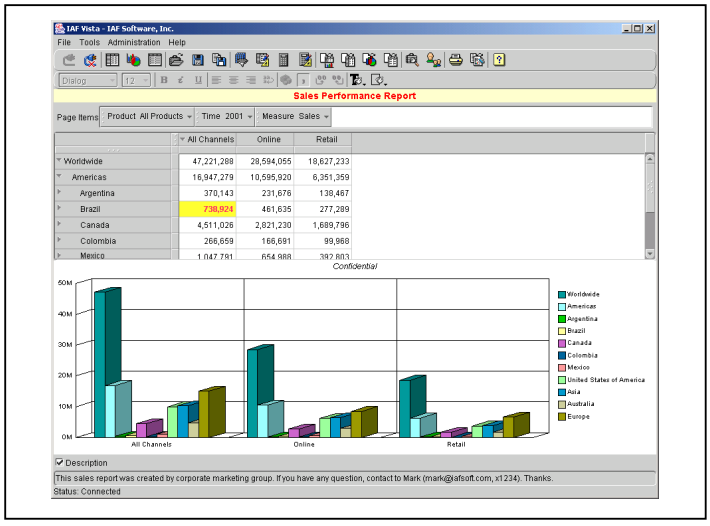

Figure 9: IAF Vista Java Client

RAPID BI APPLICATION DEVELOPMENT WITH IAF VISTA

The IAF Vista Wizard enables rapid development of BI applications. It also allows step-by-step development to include such items as title, layout (cross tab, graph, cross tab/graph coordination), and initial data. These easily-created BI applications can be shared with others in the organization because reports are stored in the repository on the server and can be accessed via users who have been granted permission.

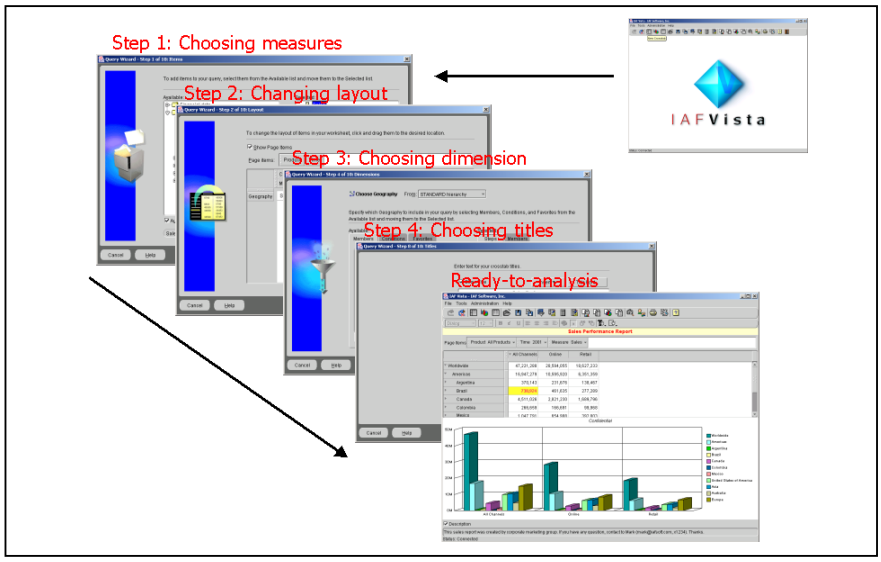

Figure10: BI application development steps using IAF Vista Wizard

SOPHISTICATED USER ADMINISTRATION

IAF Vista includes a powerful user administration function. Users can define limits on a referable BI application by user and group. The user information is administered at the repository on the server as well as at the BI application level. In addition, a simple customization allows users to sign on together and collaborate on developing an application together.

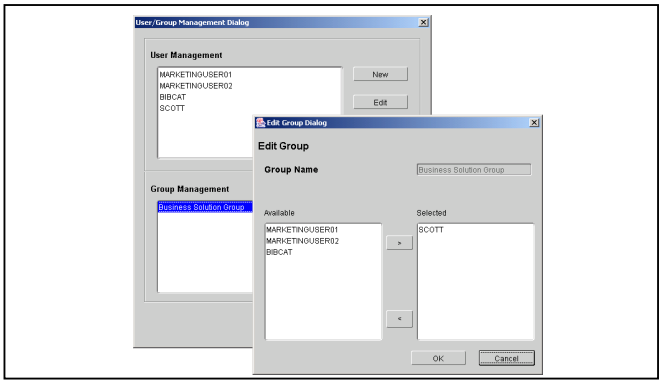

Figure11: User group and report access management by IAF Vista

WEB-BASED OLAP FUNCTIONS

All users can view and change the published reports from their Web browser. IAF Vista includes all the OLAP functions that business users have come to expect, including slice and dice, drill down, data retrieval (name list, hierarchy level, group, value, top ten/bottom ten, sort, graph), export to spread sheet, and printing. Modified reports can be saved as personal reports.

Figure12: A Web-based OLAP application developed with IAF Vista

FROM STATIC WAREHOUSES TO CONTINUALLY ENHANCED INTELLIGENCE

It's been said that the secret of data warehousing success is "think big, start small." Data warehouse architects are advised to start with a small system that incorporates the basic end-user requirements of a data warehouse and to add to it over time. However, DW and BI tools have not always allowed for changes or additions without cumbersome programming and re-configuration. IAF believes that a system should be able to evolve in a natural fashion and that the BI tools used should enable quick and easy changes. Most importantly, systems should be able to incorporate the insight of business users into the data warehouse modeling. Using IAF Coaster and IAF Vista users can create a feedback loop and continually enhance Business Intelligence systems as more knowledge is gained about the data and how that knowledge can be used to improve overall business performance.

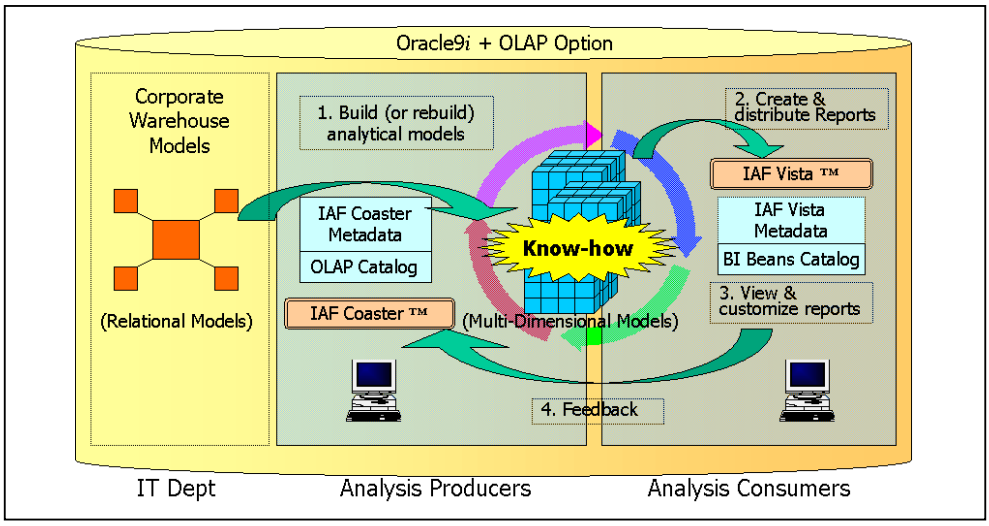

Figure13: IAF Coaster and IAF Vista allow you to continually enhance your Business Intelligence system

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