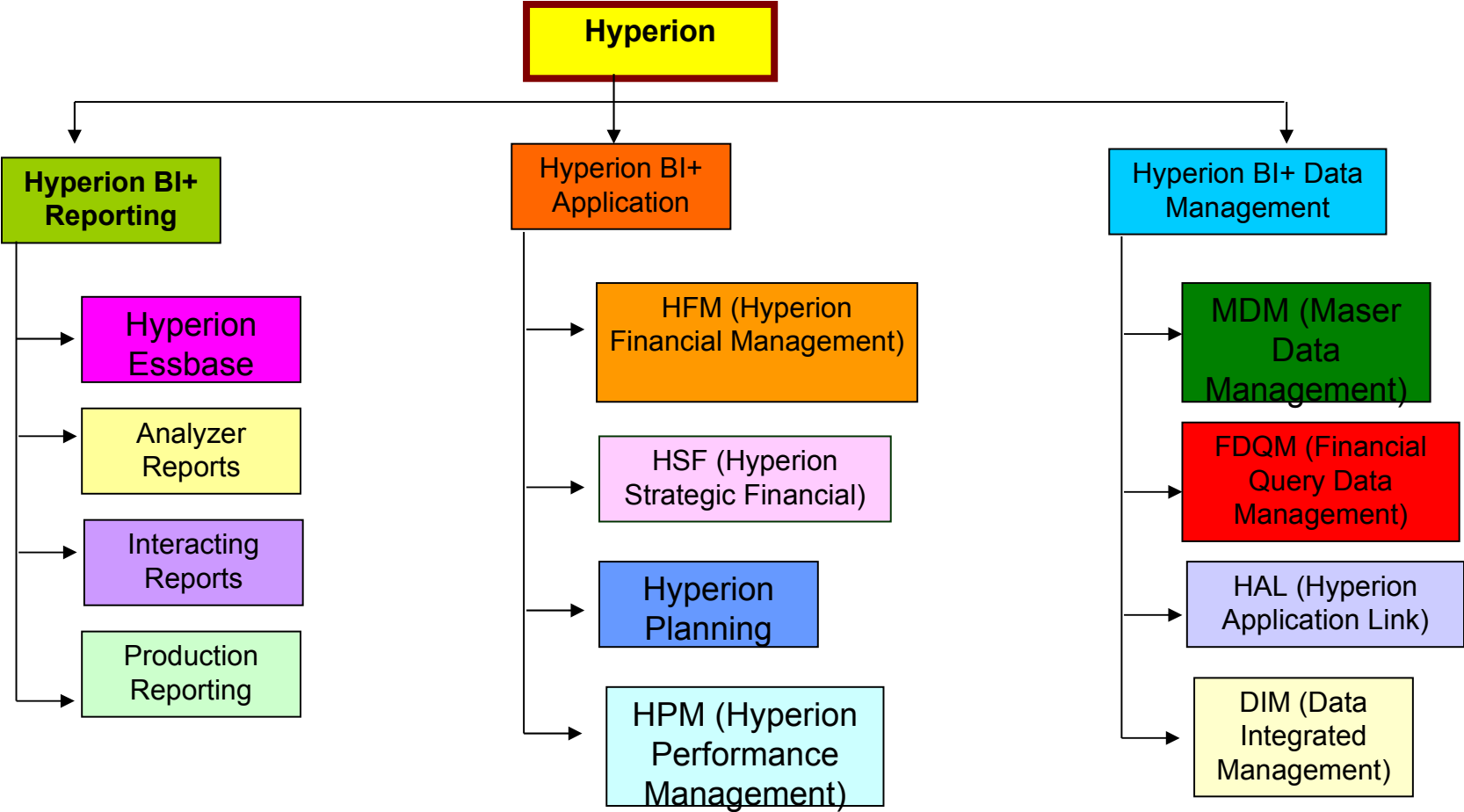


**Training
On
Oracle Hyperion Products Suite
&
Oracle Business Intelligence
Enterprise Edition**

Amit Sharma
learnhyperion.wordpress.com

Hyperion Product Suite



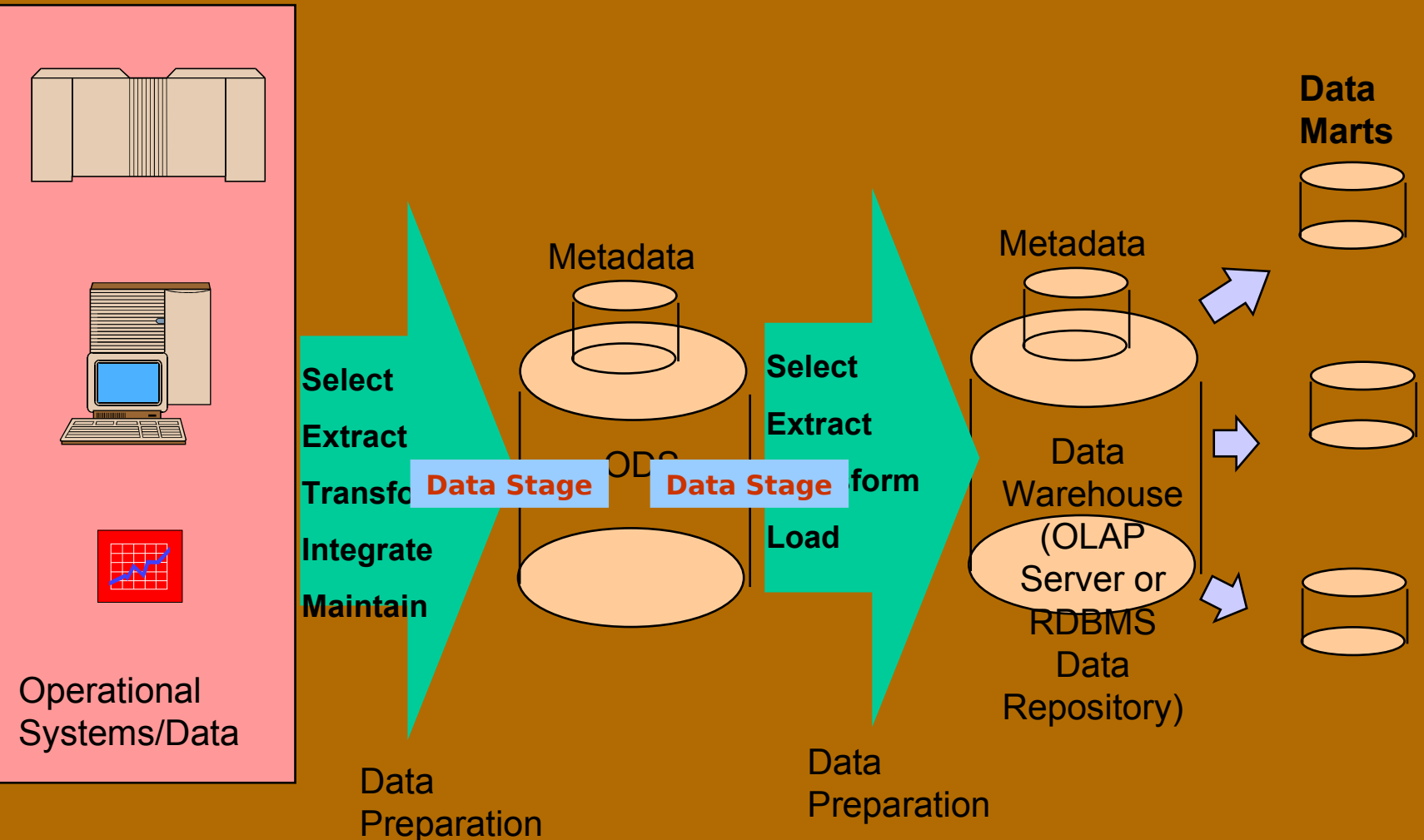
What is Essbase?

It is a **multidimensional** database that enables Business Users to analyze Business data in **multiple views/prospective** and at different consolidation levels. It stores the data in a **multi dimensional array**.

Minute->Day->Week->Month->Qtr->Year

Product Line->Product Family->Product Cat->Product sub Cat

Typical Data Warehouse

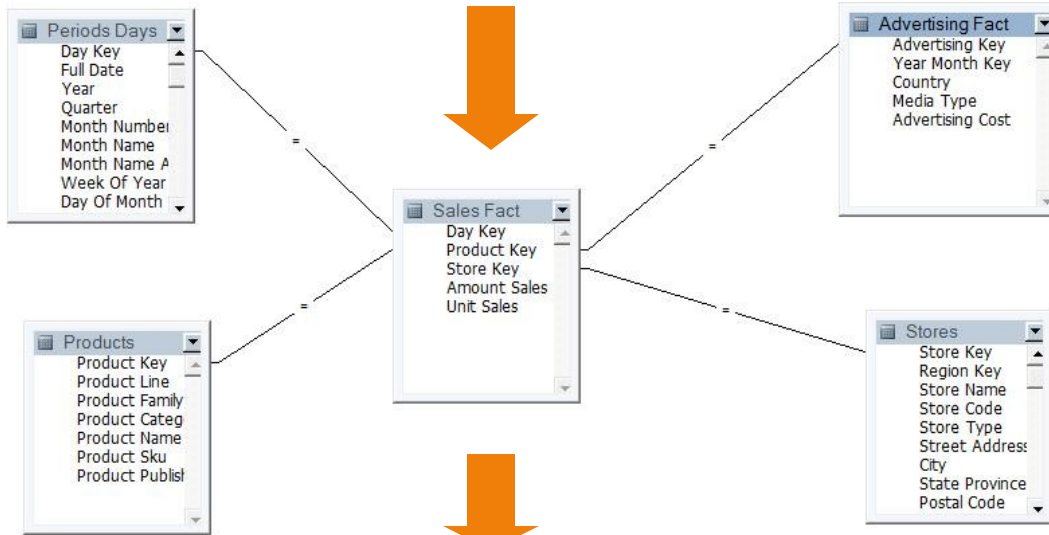


Life Cycle Of Essbase

1. Creating the Database
2. Dimensional Building
3. Data Loading
4. Performing the Calculations
5. Generating the Reports

Essbase Multi Dimension Data Modeling (Complete Life Cycle)

Physical Data Model



Physical Tables from ODS Environment

Logical Multi Dimensional Model

Multi Dimensional View

Presentation Layer Reporting

HYPERION “Essbase” Components

- 1) Essbase Analytic Server (Essbase Server)
- 2) Essbase Administration Server (User Interface)
- 3) Essbase Integration Services (RDBMS→Essbase)
- 4) Essbase Spread Sheet Services
- 5) Essbase Provider Services.
- 6) Essbase Smart-view
- 7) Essbase Studio (New Feature)

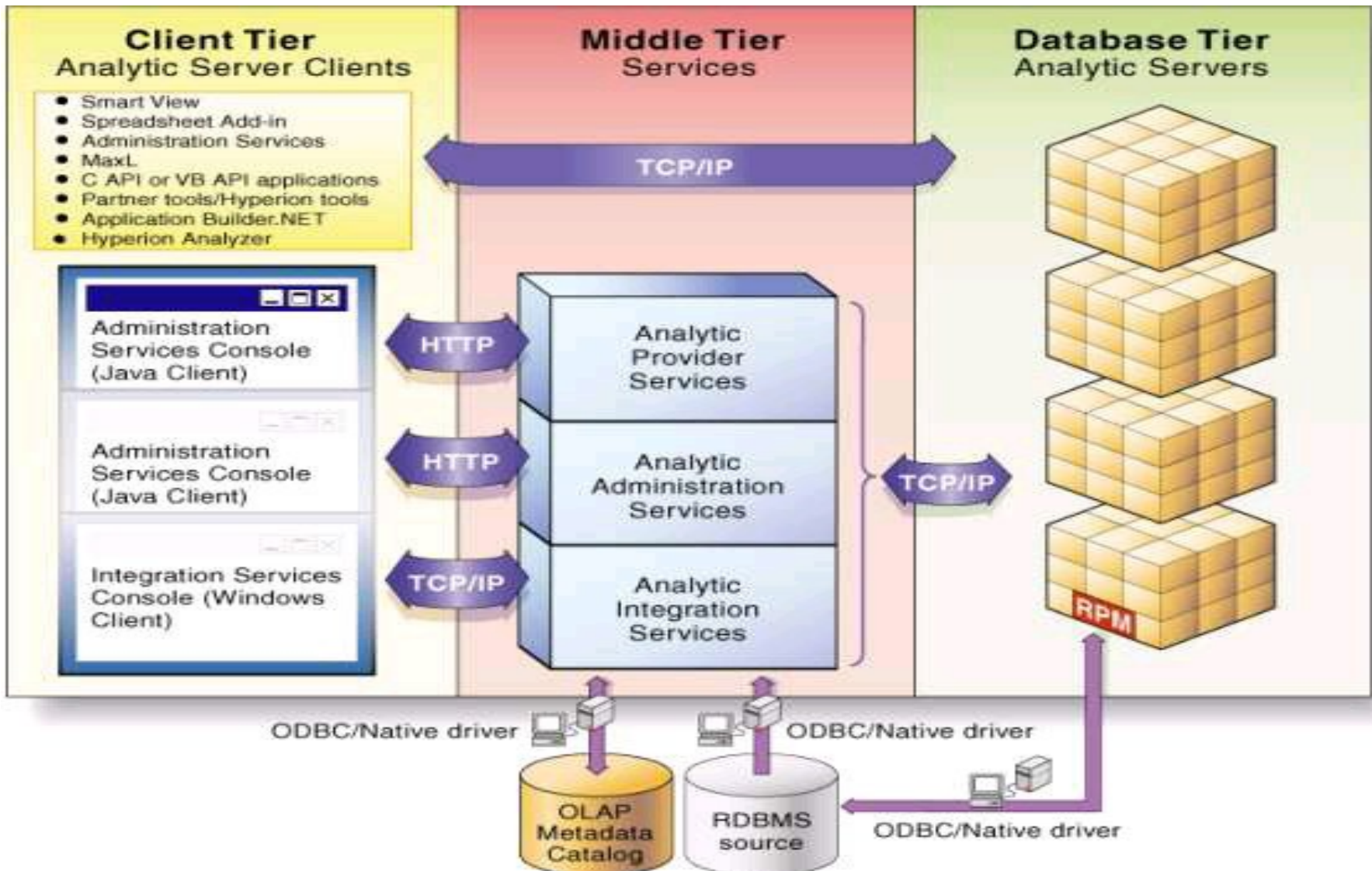
Essbase Architecture

1.Client tier

2.Middle Tier (App tier)

3.Database tier

Architecture



Contents

Overview (OLAP)

Multidimensional Analysis

- * Multidimensional Analysis Introduction
- * Operations In multidimensional Analysis
- * Multidimensional Data Model
- * Multi-Dimensional vs. Relational

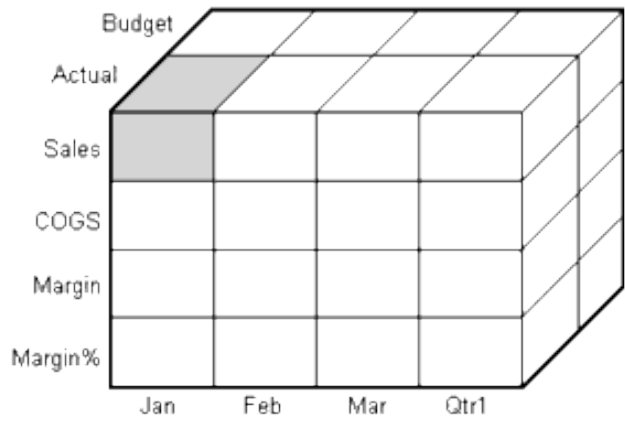
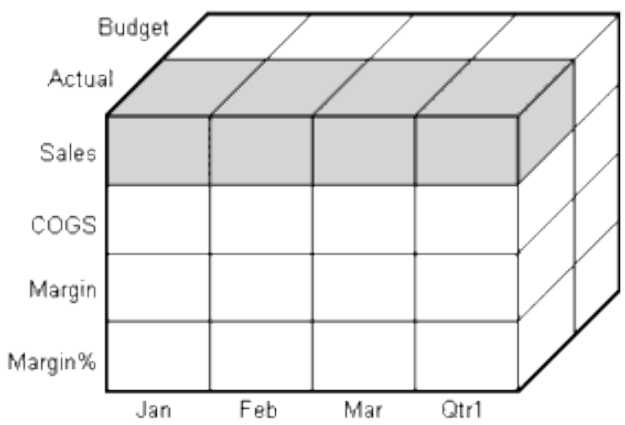
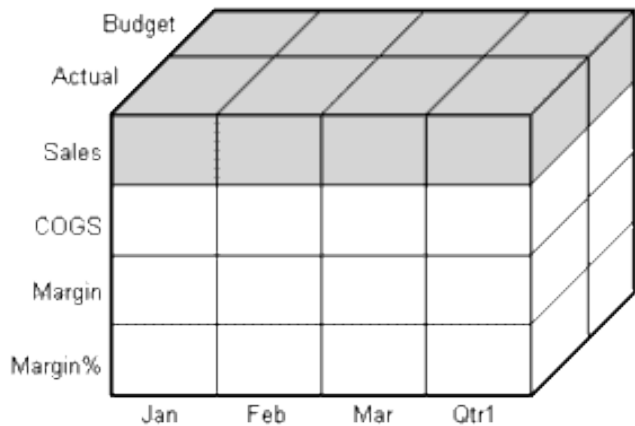
Overview of system 9.x/11.x

- * Hyperion System 9 Smart view
- * Hyperion System 9 BI+ Interactive reporting
- * Hyperion System 9 BI+ Analytic services
- * Hyperion system 9 shared services
- * Hyperion system 9 White Board

Introduction to Essbase

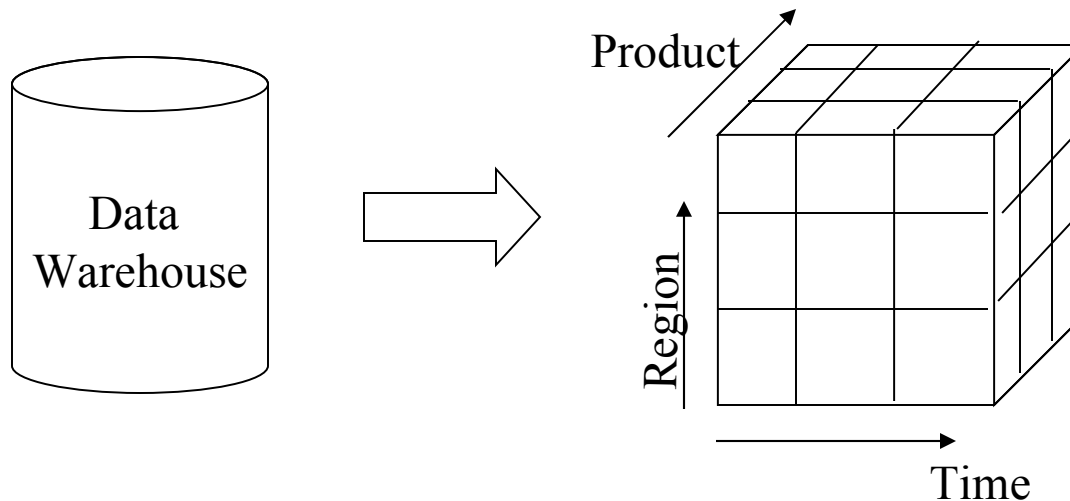
Multidimensional Viewing and Analysis

Sales Slice of the Database



Online Analysis Processing(OLAP)

It enables analysts, managers and executives to gain insight into data through fast, consistent, interactive access to a wide variety of possible views of information that has been transformed from raw data to reflect the real dimensionality of the enterprise as understood by the user.



Overview of OLAP

OLAP can be defined as a technology which allows the users to view the aggregate data across measurements (like Maturity Amount, Interest Rate etc.) along with a set of related parameters called dimensions (like Product, Organization, Customer, etc.)

Relational OLAP (ROLAP)

- Relational and Specialized Relational DBMS to store and manage warehouse data
- OLAP middleware to support missing pieces
 - Optimize for each DBMS backend
 - Aggregation Navigation Logic
 - Additional tools and services
- Example: Micro strategy, MetaCube (Informix)

Multidimensional OLAP (MOLAP)

- Array-based storage structures
- Direct access to array data structures
- Example: Essbase (Arbor), Accumate (Kenan)

Domain-specific enrichment

Implementation Techniques

OLAP

ROLAP

Relational
OLAP

**ROLAP - Relational
OLAP**

Access Data stored
in relational Data
Warehouse for
OLAP Analysis

MOLAP

Multidimensional
OLAP

**MOLAP - Multidimensional
OLAP**

Multidimensional
Databases for database

HOLAP

Hybrid
OLAP

HOLAP - Hybrid OLAP

OLAP Server routes
queries first to MDDB,
then to RDBMS and result
processed on-the-fly in
Server

Key Features of OLAP applications

- Multidimensional views of data
- Calculation-intensive capabilities
- Time intelligence

**Key to OLAP systems are multidimensional databases.

- Multidimensional databases not only consolidate and calculate data; they also provide retrieval and calculation of a variety of data subsets.
- A multidimensional database supports multiple views of data sets for users who need to analyze the relationships between data categories

Ex: Did this product sell better in particular regions? Are there regional trends?

Did customers return Product A last year? Were the returns due to product defects?

What is Multidimensional Analysis

Multidimensional Analysis

A *multidimensional database* supports multiple views of data sets for users who need to analyze the relationships between data categories. For example, a marketing analyst might want answers to the following questions:

- How did Product A sell last month? How does this figure compare to sales in the same month over the last five years? How did the product sell by branch, region, and territory?
- Did this product sell better in particular regions? Are there regional trends?

Multidimensional databases consolidate and calculate data to provide different views. Only the database outline, the structure that defines all elements of the database, limits the number of views. With a multidimensional database, users can *pivot* the data to see information from a different viewpoint, *drill down* to find more detailed information, or *drill up* to see an overview.

Multidimensional Analysis

Analysis of data from multiple perspectives.

Jan Gross Sales For all the products and all customers in the current year. This will give the details that which customer bought the most sales and which product sold least in a month and year

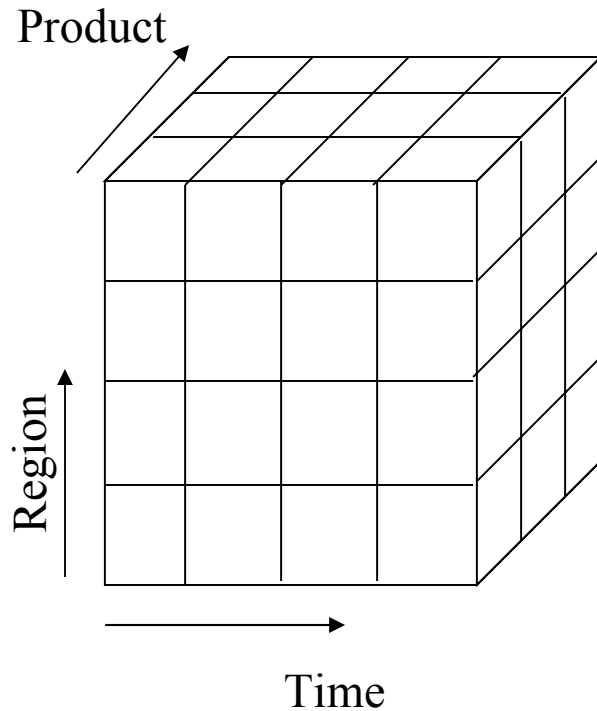
Sales Report By Month			
All Products		Customer	Product
Month	Jan	Feb	Mar
Gross Sales	2,358,610	2,345,890	58,860
Discount	116,616	138,856	20,567
Net Sales	2,477,428	2,566,526	89,196

Product Report By Month			
Gross Sales		Customer	Product
Month	Jan	Feb	Mar
Performance	1,597,560	1,697,890	775,600
Values	116,616	138,856	20,567
All Products	2,358,610	2,566,526	89,196

Variance Report By Channel			
All Products		Gross Sales	Jan
Gross Sales	Current Year	Budget	Act Vs Bud
Performance	775,600	1,697,890	224,160
Values	116,616	1,651,006	20,567
All Products	2,358,610	2,566,526	89,196

OLAP Operations

Drill Down



Category e.g Electrical Appliance



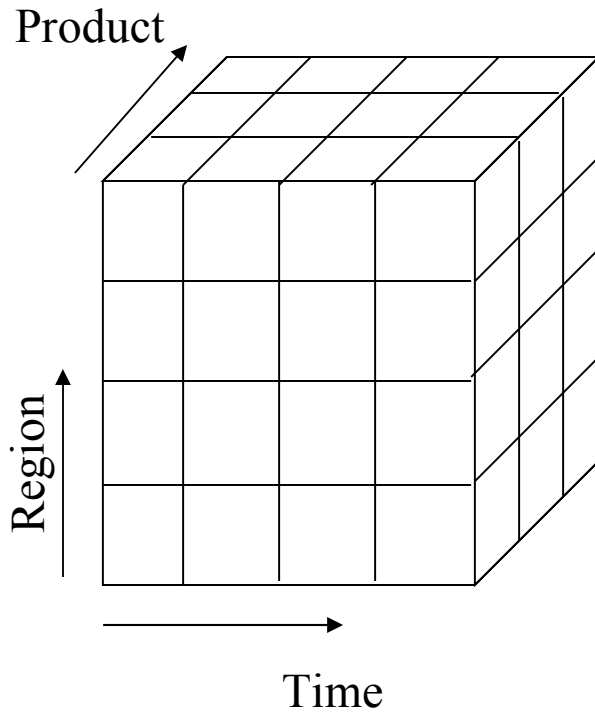
Sub Category e.g Kitchen




Product e.g Toaster

OLAP Operations

Drill Up



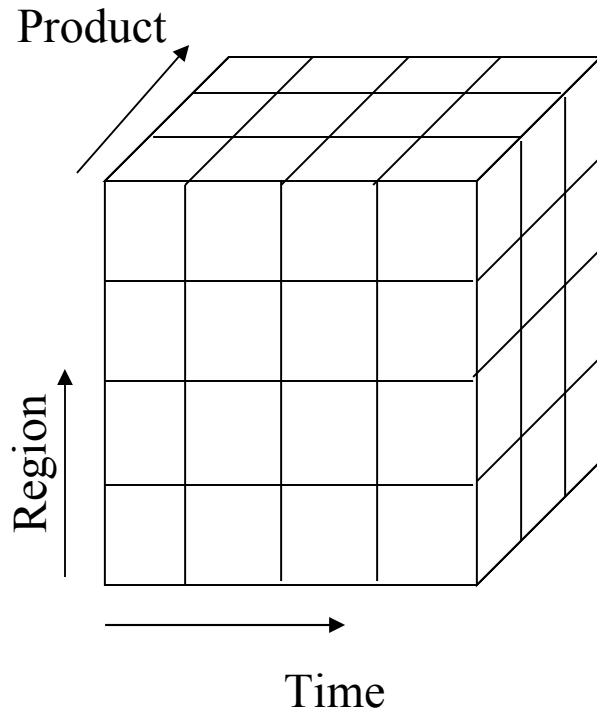
Category e.g Electrical Appliance

Sub Category e.g Kitchen 

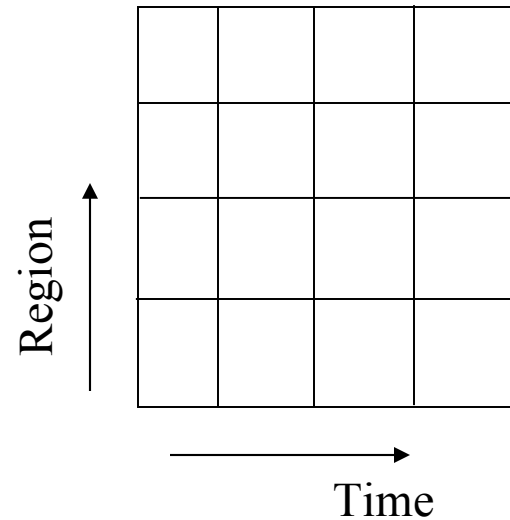
Product e.g Toaster 

OLAP Operations

Slice and Dice

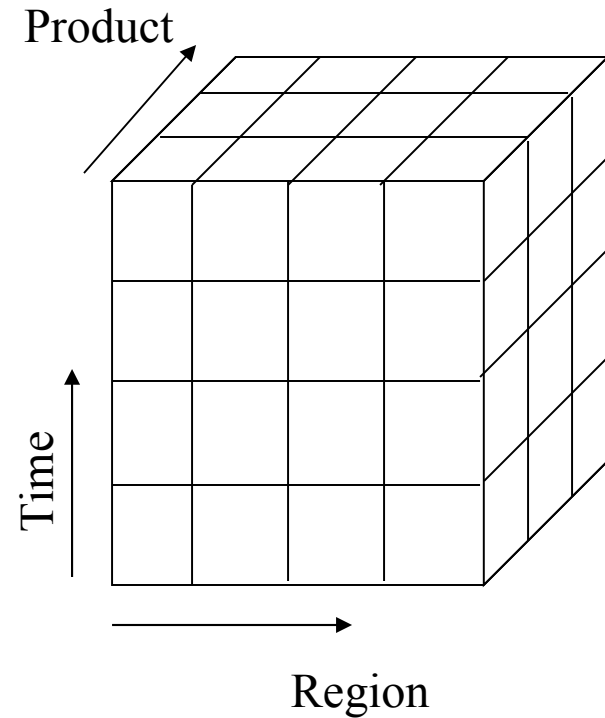
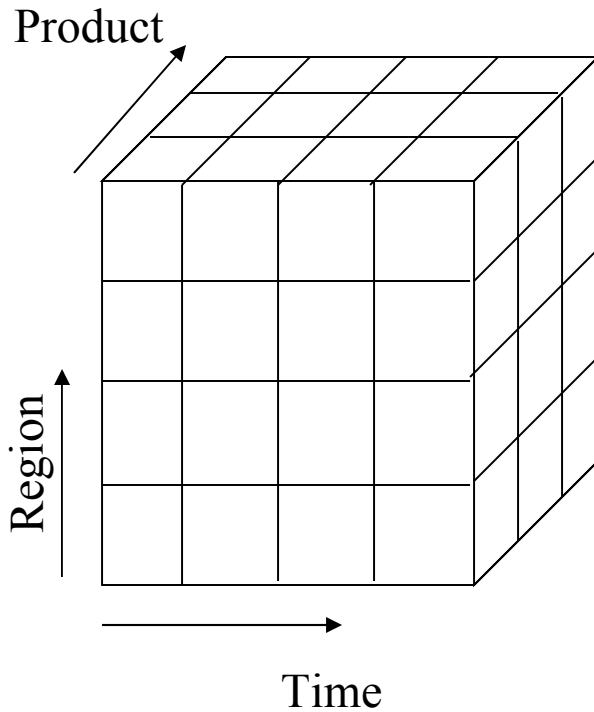


Product=Toaster



OLAP Operations

Pivot



Operations In multidimensional Analysis

Aggregation (*roll-up*)

- ▶ dimension reduction: e.g., total sales by city
- ▶ summarization over aggregate hierarchy: e.g., total sales by city and year
-> total sales by region and by year

Selection (*slice*) defines a sub cube

- ▶ e.g., sales where city = Palo Alto and date = 1/15/96

Navigation to detailed data (*drill-down*)

- ▶ e.g., (sales - expense) by city, top 3% of cities by average income

Visualization Operations (e.g., Pivot)

Multidimensional Data Model

Database is a set of *facts* (points) in a multidimensional space

A fact has a *measure* dimension

- ▼ quantity that is analyzed, e.g., sale, budget, Operating Exp,

A set of *dimensions* on which data is analyzed

- ▼ e.g. , store, product, date associated with a sale amount

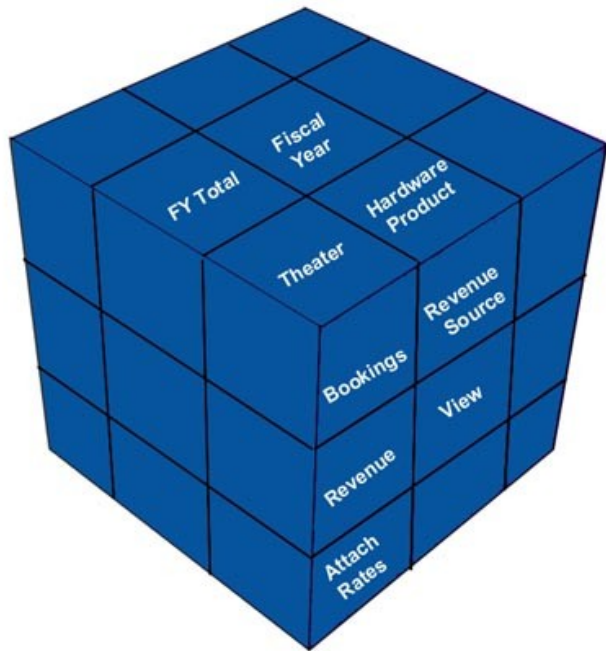
Dimensions form a sparsely populated coordinate system

Each dimension has a set of *attributes*

- ▼ e.g., owner city and county of store

Attributes of a dimension may be related by partial order

- ▼ *Hierarchy*: e.g., street > county > city
- ▼ *Lattice*: e.g., date > month > year, date > week > year

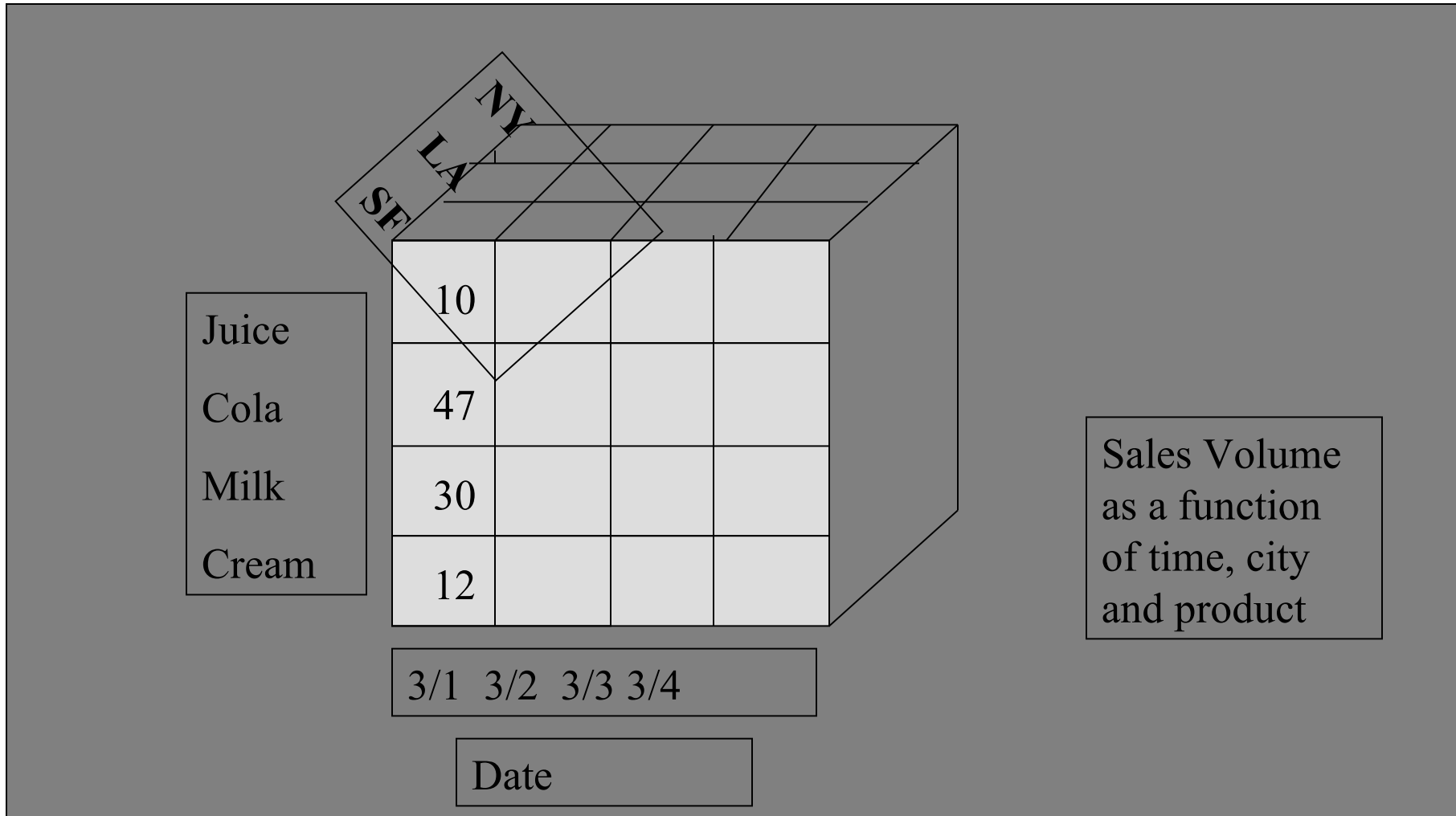


Uses a *cube* metaphor to describe data storage.

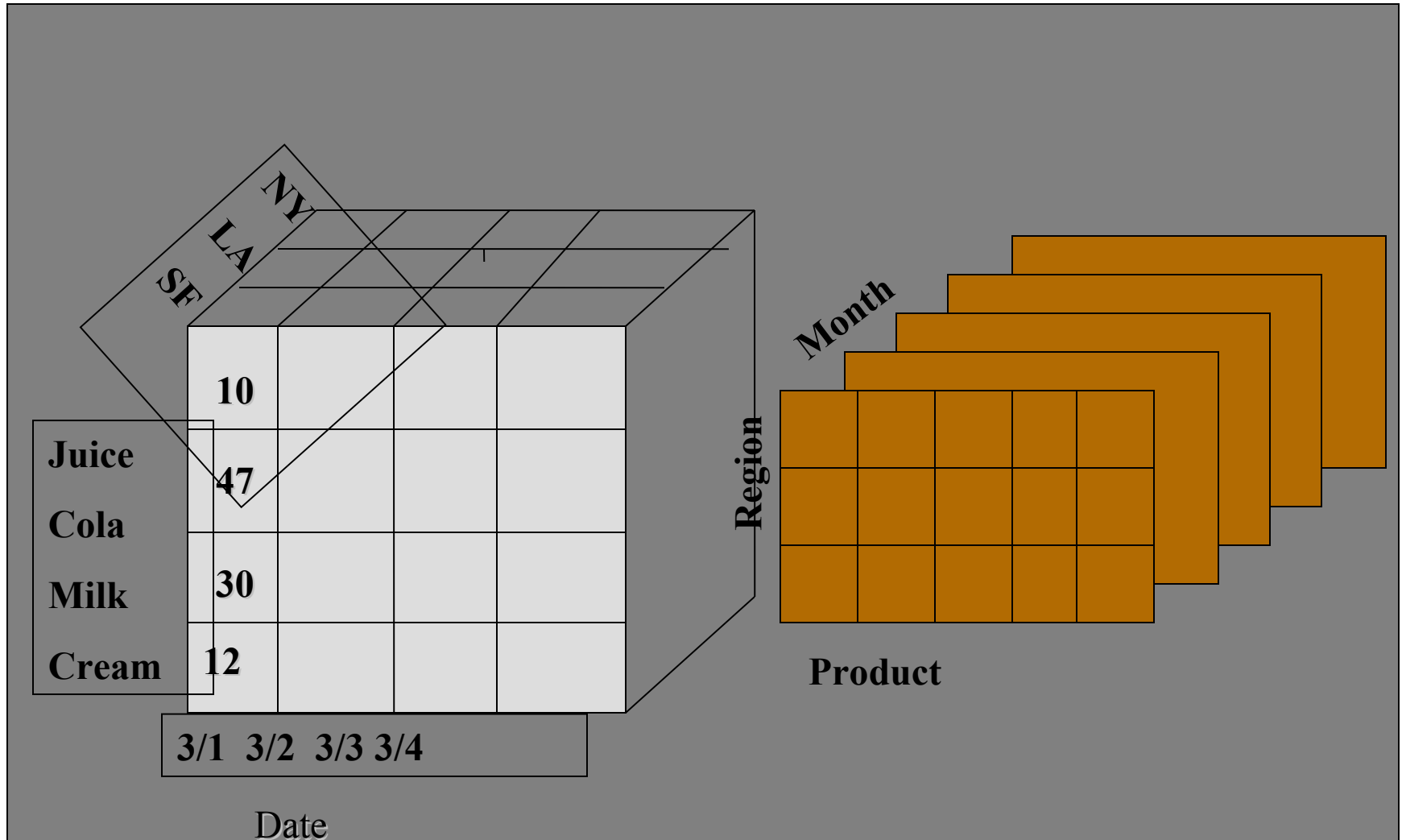
An Essbase database is considered a “cube”, with each cube axis representing a different *dimension*, or slice of the data (accounts, time, products, etc.)

All possible data intersections are available to the user at a click of the mouse.

Multidimensional Data

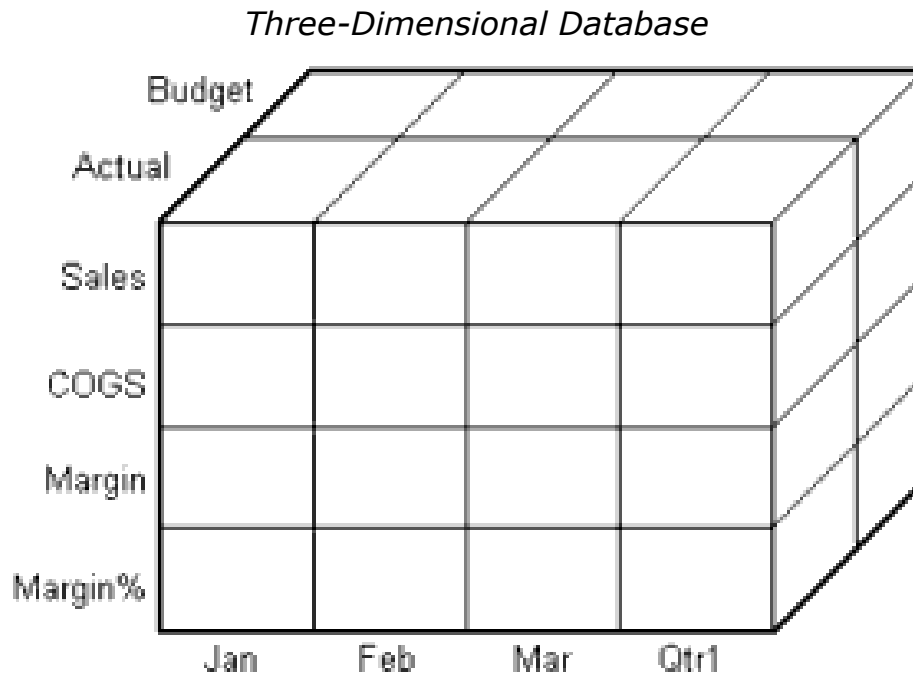


A Visual Operation: Pivot (Rotate)



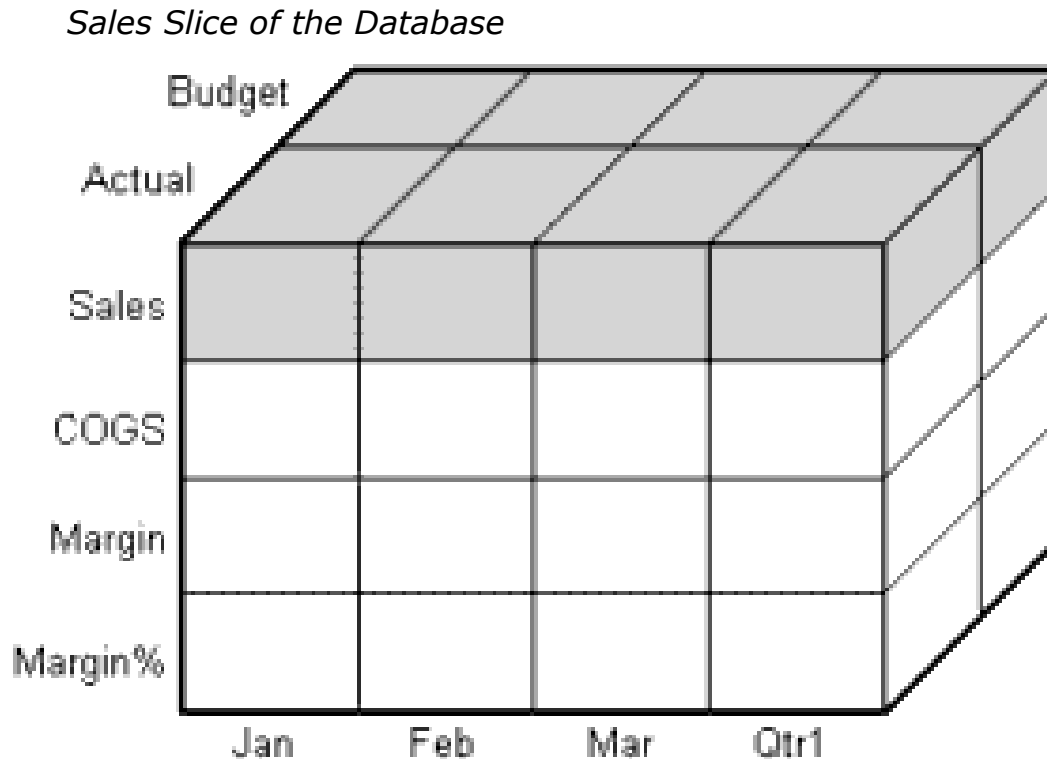
Multidimensional Viewing and Analysis

Consider the three dimensions in a databases as Accounts, Time, and Scenario where Accounts has 4 members, Time has 4 members and Scenario has two members.



Multidimensional Viewing and Analysis

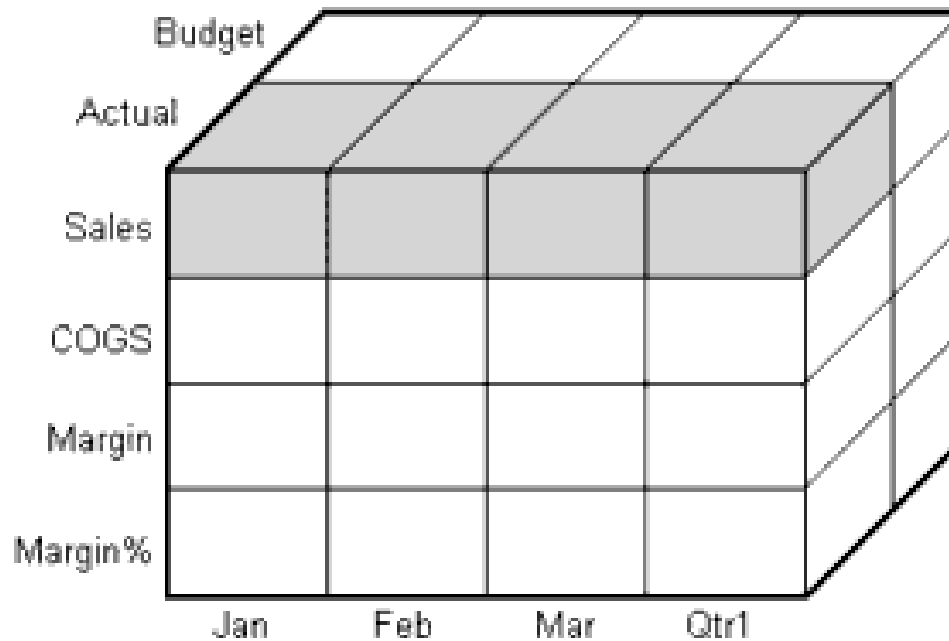
The shaded cells is called a slice illustrate that, when you refer to Sales, you are referring to the portion of the database containing eight Sales values.



Multidimensional Viewing and Analysis

When you refer to Actual Sales, you are referring to the four Sales values where Actual and Sales intersect as shown by the shaded area.

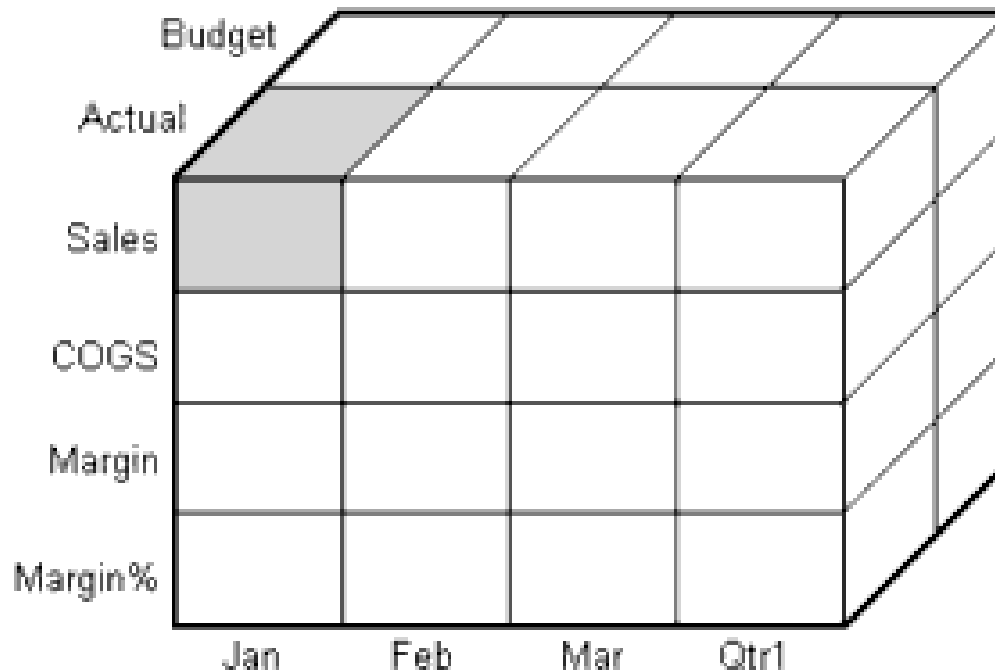
Actual, Sales Slice of the Database



Multidimensional Viewing and Analysis

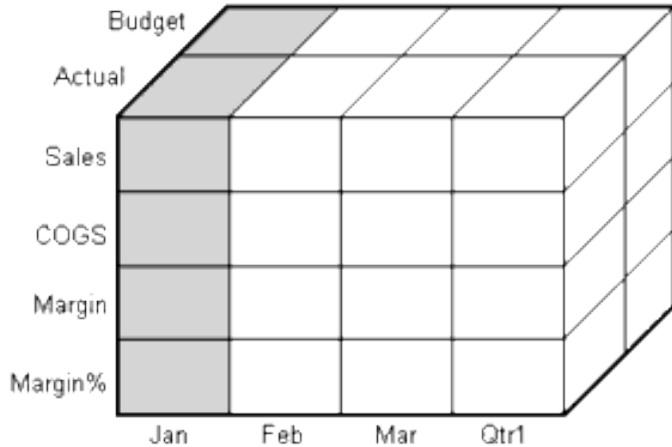
Data value is stored in a single cell in the database. To refer to a specific data value in a multidimensional database, you specify its member on each dimension. The cell containing the data value for Sales, Jan, Actual is shaded. The data value can also be expressed using the cross-dimensional operator (->) as Sales -> Actual -> Jan.

Sales -> Jan -> Actual Slice of the Database

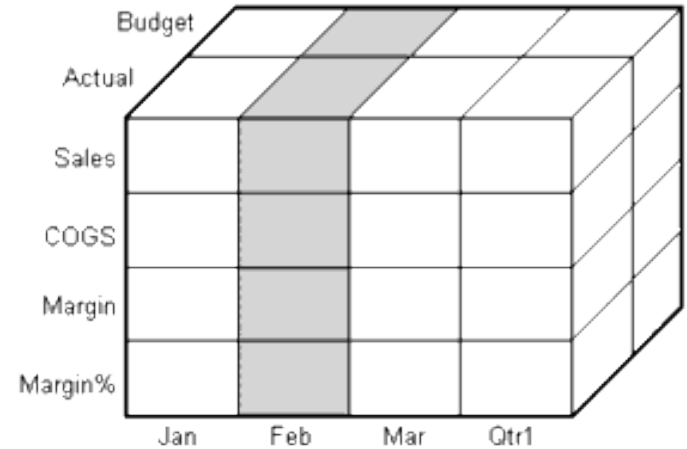


Multidimensional Viewing and Analysis

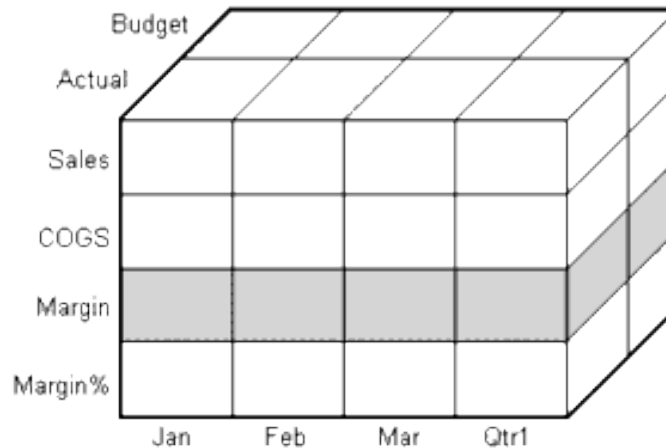
Data for January **Data from Different Perspective**



Data for February



Data for Profit Margin



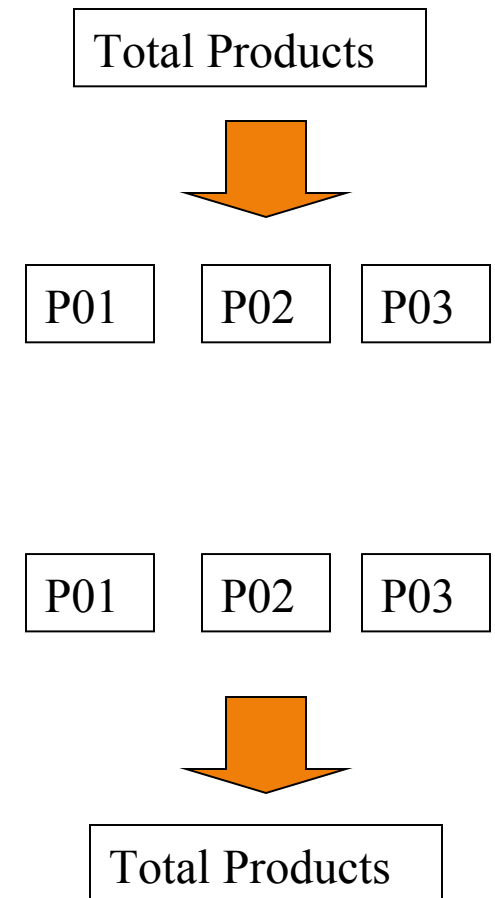
Multi-Dimensional vs. Relational

Multi-dimensional database are usually queried top-down – the user starts at the top and drills into dimensions of interest.

- **Can perform poorly for transactional queries**

Relational databases are usually queried bottom-up – the user selects the desired low level data and aggregates.

- **Harder to visualize data; can perform poorly for high-level queries**





OLAP Vs RDBMS

In RDBMS, we have:

DB -> Table -> Columns -> Rows

In OLAP, we have:

CUBES

RDBMS	OLAP
2 Dimensions	Multi Dimensions
All Data types	Only numbers
	

Questions??????