Faster and Smarter Data Warehouses with Oracle OLAP 11g

E.F. Codd
Providing OLAP to Analysts: An IT Mandate

"**Relational DBMS products have boundaries** with respect to providing function to support user views of data. The ability to consolidate, to view, and to analyze data according to multiple dimensions, in ways that make sense to one or more specific enterprise analysts at any given point in time, has been lacking."
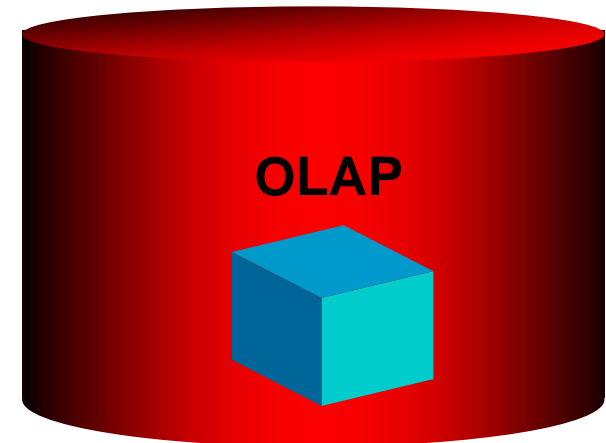
E.F. Codd
Providing OLAP to Analysts: An IT Mandate

"The need which exists is NOT for yet another database technology. Instead, **organizations require robust OLAP data analysis tools which complement the enterprise's existing data management system** and which are rigorous enough to anticipate and facilitate the types of sophisticated business data analysis inherent in OLAP."

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Oracle OLAP 11g – Relational and OLAP!

- An integrated component of Oracle Database 11g that enables companies to easily gain insights into business performance. It offers:
  - Exceptional query, calculation and data preparation performance
  - Rich analytic capabilities
  - Simple user model that reflects business usage

- Oracle OLAP is the only OLAP engine on the market
  - ✓ This is fully embedded within a database
  - ✓ That is fully accessible via SQL

OLAP

Therefore it can provide advanced calculation capabilities to <u>any </u>business application

Business Advantages of Oracle 11g OLAP Option

- Enhanced business analysis
  - Complex calculations
    - Compare things e.g. last year to now
    - More sophisticated analytical calculations
  - More interactive analysis of data
    - Advanced data selections using many combined criteria
    - Intuitive, hierarchical navigation
- More timely data
  - It's easier and faster to aggregate dimensional data
- Query performance is both faster and more consistent

Business Advantages of Oracle 11g OLAP Option
Enhanced business analysis

- Example - Multidimensional Calculations & Complex Embedded Queries
  - Uni-dimensional
    - "What are my top ten products?"
  - Multidimensional
    - 'What was the percent change in market share for a grouping of my top 20% of products for the current three month period versus same period year ago for accounts which grew by more than 20 percent in revenue?"

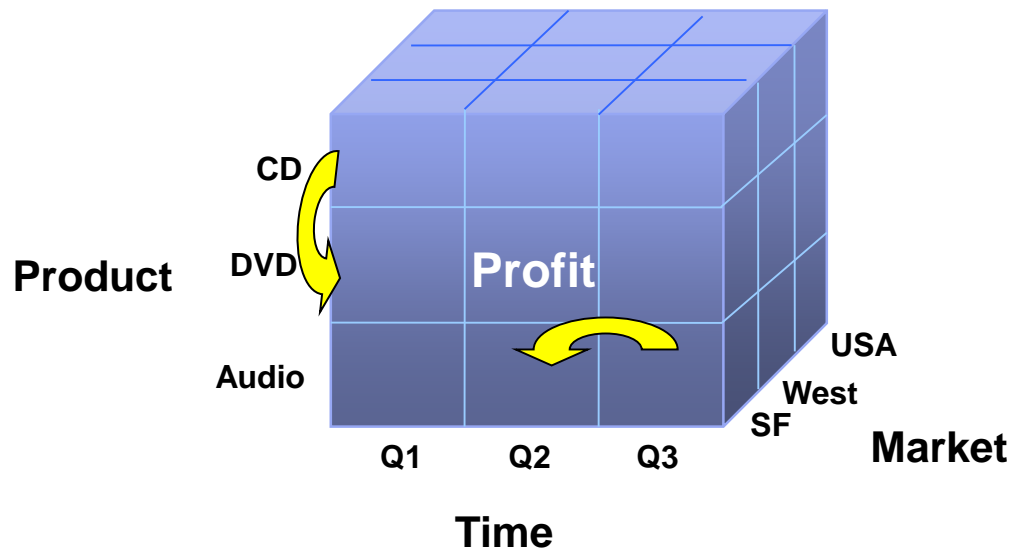**ORACLE**

Business Advantages of Oracle 11g OLAP Option
Enhanced business analysis

Solution - Multidimensional Array Storage
Structured around business rules

Compare Profit this Quarter versus Last Quarter
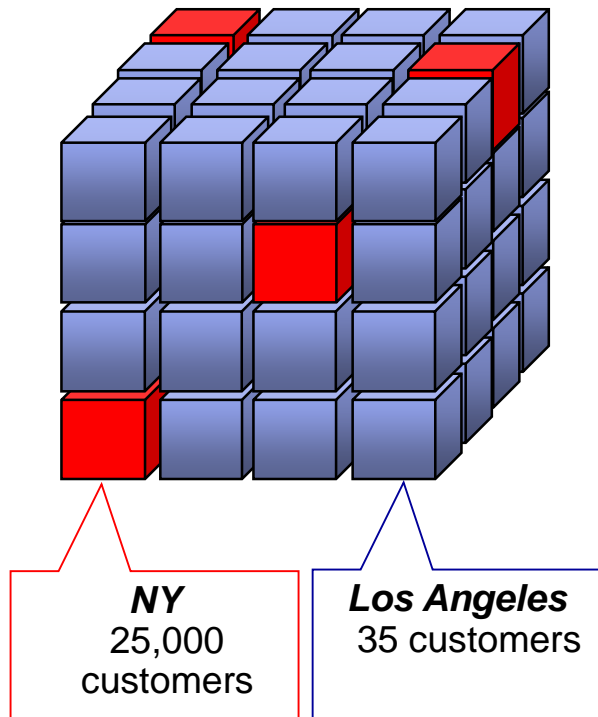
What is a Product's Profit Share of its Category?

Easy Analytics
Analytic Functions

- **Time series Analysis**
- **Non-additive aggregations**
- **Financial calculations**
- **Statistical forecasting**
- **Models**
- **Allocations**
- **Statistical functions**
- **Regression functions**
- Data stored in dense arrays
- Offset addressing – no joins
- More powerful analysis
- Better performance
- Complex Hierarchy Support

Cost Based Aggregation
Pinpoint Summary Management

NY
25,000 customers

Los Angeles
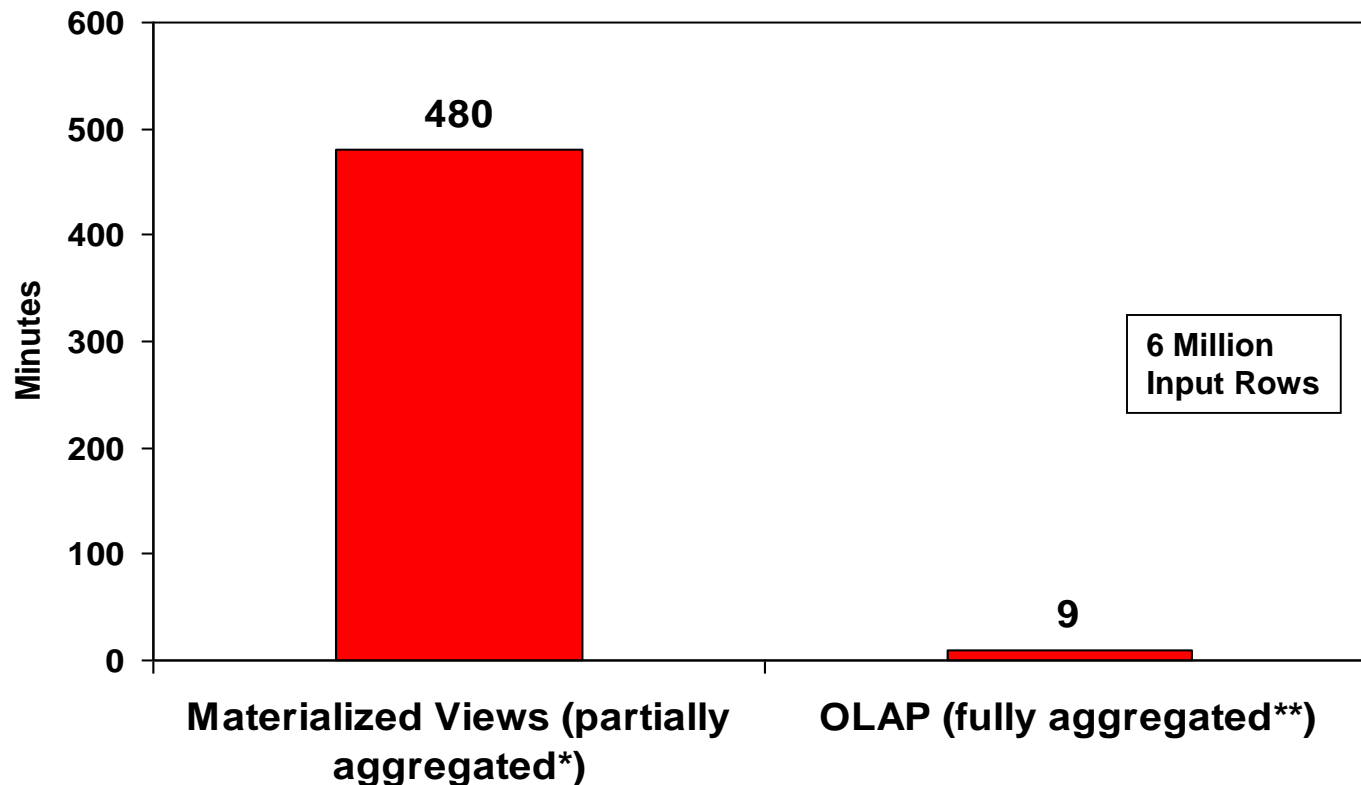35 customers

■ **Precomputed**

■ **Computed when queried**

- Improves aggregation speed and storage consumption by pre-computing *cells* that are most expensive to calculate

- Easy to administer

- Simplifies SQL queries by presenting data as fully calculated

Business Advantages of Oracle 11g OLAP Option
More timely data

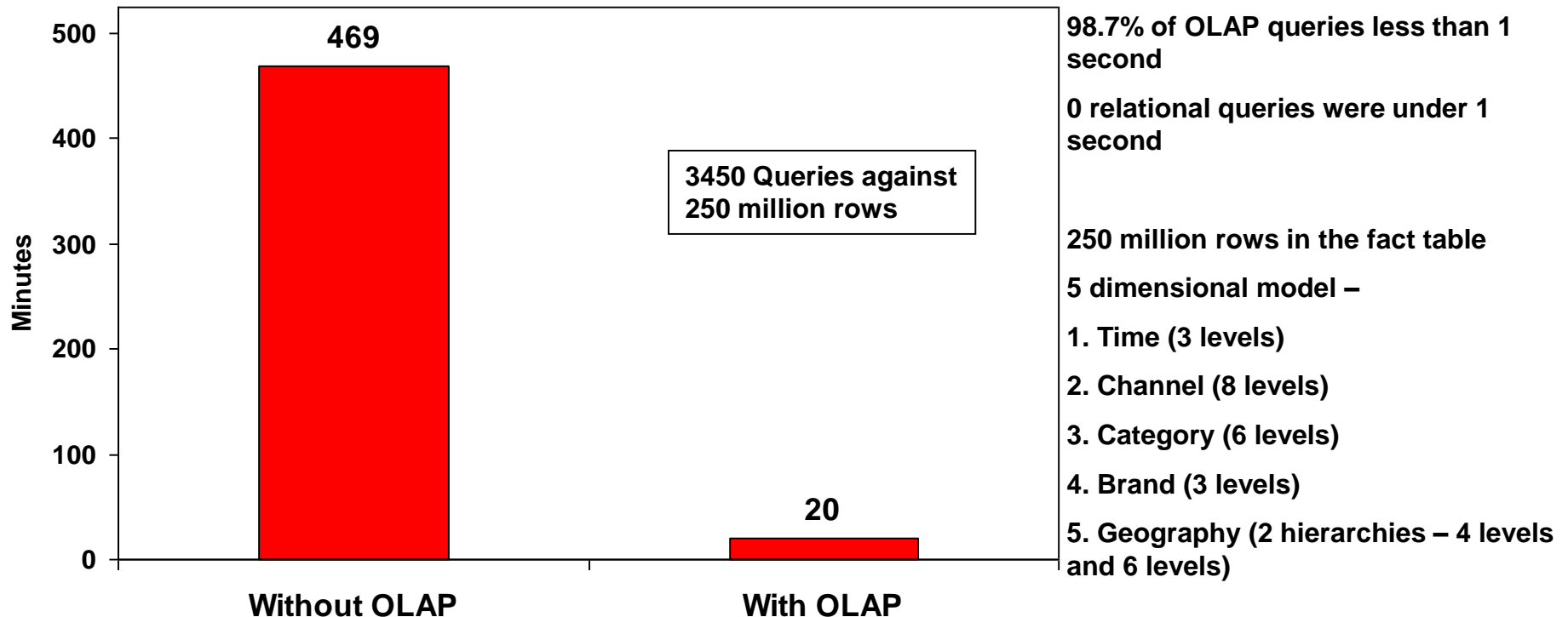- Quick aggregation so users' data is ready when they are

* MV aggregated 1 dimension and 1 measure
** OLAP aggregated 7 dimensions and 11 measures
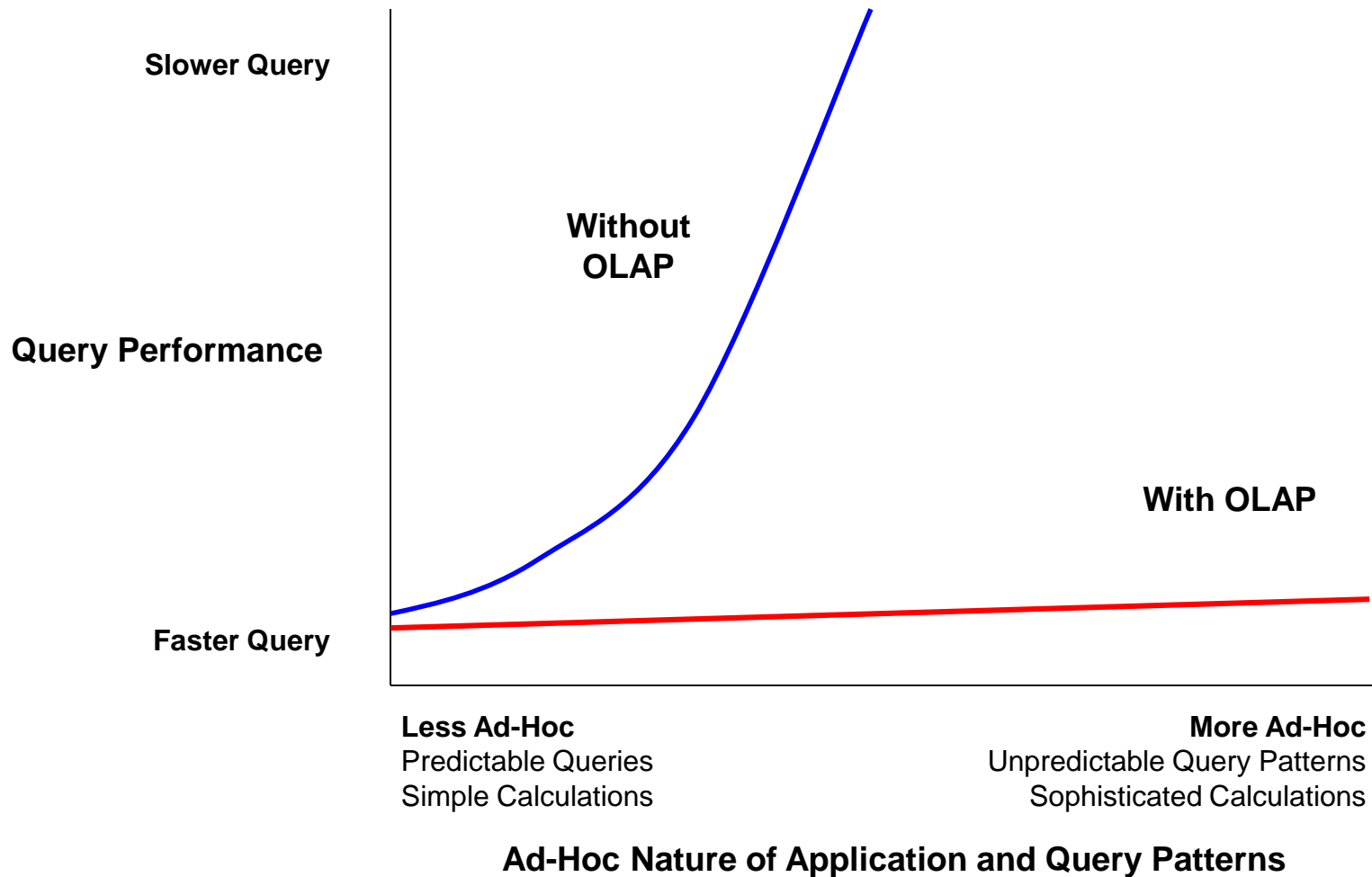
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Business Advantages of Oracle 11g OLAP Option
Query performance is both faster and more consistent

Performance Case Study
Ad Hoc Queries Across Summary Levels

Without OLAP: 469 minutes

With OLAP: 20 minutes

3450 Queries against 250 million rows

Minutes (Y-axis: 0, 100, 200, 300, 400, 500)

98.7% of OLAP queries less than 1 second

0 relational queries were under 1 second

250 million rows in the fact table

5 dimensional model –

1. Time (3 levels)

2. Channel (8 levels)

3. Category (6 levels)

4. Brand (3 levels)

5. Geography (2 hierarchies – 4 levels and 6 levels)

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Business Advantages of Oracle 11g OLAP Option
Query performance is both faster and more consistent

Slower Query

Without OLAP

Query Performance

With OLAP

Faster Query

Less Ad-Hoc
Predictable Queries
Simple Calculations

More Ad-Hoc
Unpredictable Query Patterns
Sophisticated Calculations

Ad-Hoc Nature of Application and Query Patterns

Proven Scalability @ GALLUP

- Supports business intelligence applications without replicating large amounts of data in specialized analytical databases

- Rapid response time, for large documents that contain more than 20 thumbnail graphs and 20 cross tabs per page

"We needed a solution that would allow us to achieve 1000 concurrent users across the globe initially; our custom application using SQL to access AW data provides us with a scalable solution which achieves these goals. This OLAP application will become extremely important in our solution offering to many customers."

Ken Ewald

Gallup Organization

Human Behavior Analysis
1,000 Concurrent Users

Stock and Equity Real Time Analysis at BNP PARIBAS

Benefits

- Real time analysis of stock information
- Implemented extremely sophisticated calculations
- Use with existing query tool (spreadsheets)
- Reduced maintenance costs

"The advantages of Oracle 10G's scalability, reliability, ease of maintenance, performance and an industry standard analytical query language made it the natural choice to replace our existing system".

Cyrus Kapadia

Large Volumes of Data

- 10 million values loaded every day
- Immediate Analysis and Decision Making
  - Refreshed every 2 seconds
  - Information is never more than12 seconds out of date
- Sub second response time
  - couple of seconds for very complex reports
- 20 million data requests per day from 4000 users
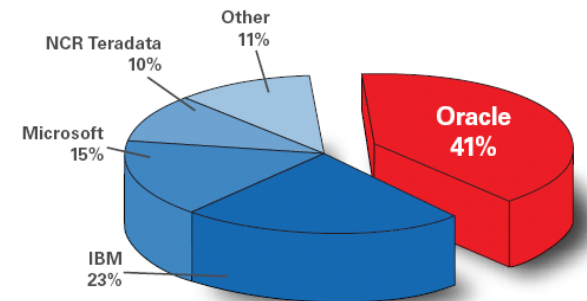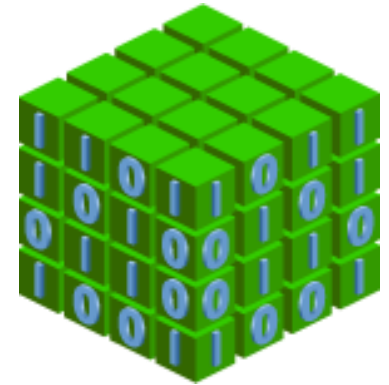

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Replaced FAME application to provide in depth statistical analysis

Oracle OLAP Features and Benefits

- Core component of Market leading Oracle DB

- Highly scalable OLAP server

- Centralized Business Model view

- Sophisticated Calculation Engine with hundreds of pre-built

functions

- Financial Intelligence, Time Series Intelligence, Business metrics

- Consistent, "Speed of Thought" response

- Real time loading capabilities

- Open SQL access or API

- High Concurrency, Partitioning, Clustering, Failover

- Mission Critical Performance and Scalability

- Unmatched data security

Worldwide Data Warehouse Management
Market Share, 2006

Other
11%

NCR Teradata
10%

Microsoft
15%

Oracle
41%

IBM
23%

ORACLE®

Source: IDC, 2007 – Data Warehouse Platform Tools 2006 Vendor Shares

Fast Query

Fast Update

Rich Calculations

Dimensional Model

ORACLE IS THE **INFORMATION** COMPANY