Business School
UNIVERSITY OF COLORADO DENVER

Information Systems Program

Business Intelligence Concepts, Tools, and Applications

Week 2: Business Intelligence Concepts and Platform Capabilities

Lesson 4: BI OLAP Styles

BI OLAP Styles Versus OLTP

- Learning Objectives
  - Compare and contrast different types of OLAP
  - Understand different applications of OLAP
  - Comprehend the differences between OLAP and OLTP

OLAP Applications – contd.

- Budgeting & Financial Reporting
  - Requires multiple dimensions such as Time, Account, Organization, Product segment etc.
- EIS, Balanced Scorecards
  - Management Reporting based on P&L Ratios
  - KPIs, CSFs
- Other Applications
  - Profitability Analysis
  - Defect Analysis
  - Quality Analysis

Adopted from Teradata University Network presentation on OLAP.

OLAP Applications

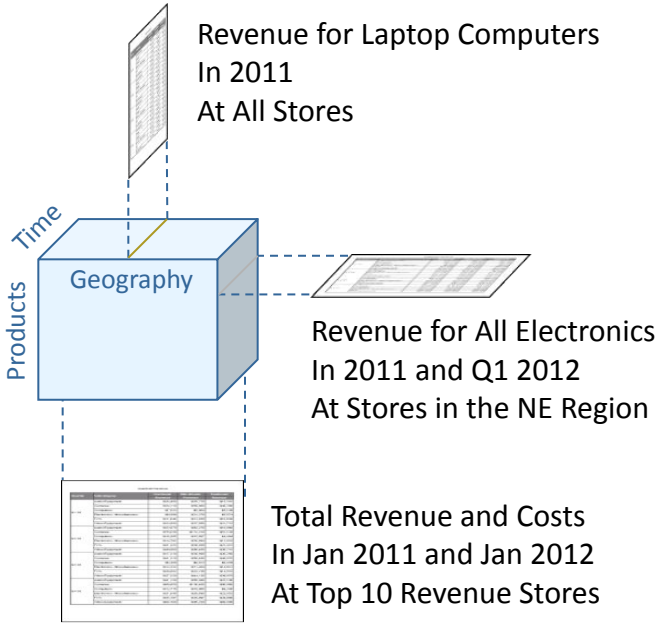
- Marketing & Sales Analysis
  - Consumer Goods Industries, Retailers
  - Financial Services (Banks, Insurance etc.)
- Clickstream Analysis & Web Analytics
  - Pure Play E-commerce Sites
  - Click-n'-Mortar Organizations
- Database Marketing & CRM
  - Customer Segmentation
  - Customer Value Analysis

OLAP Styles

- ROLAP- Relational OLAP (using relational databases; a star schema is used)
- MOLAP- Multidimensional OLAP (using multidimensional databases)
- HOLAP (Hybrid Online Analytical Processing)
- DOLAP- desktop OLAP

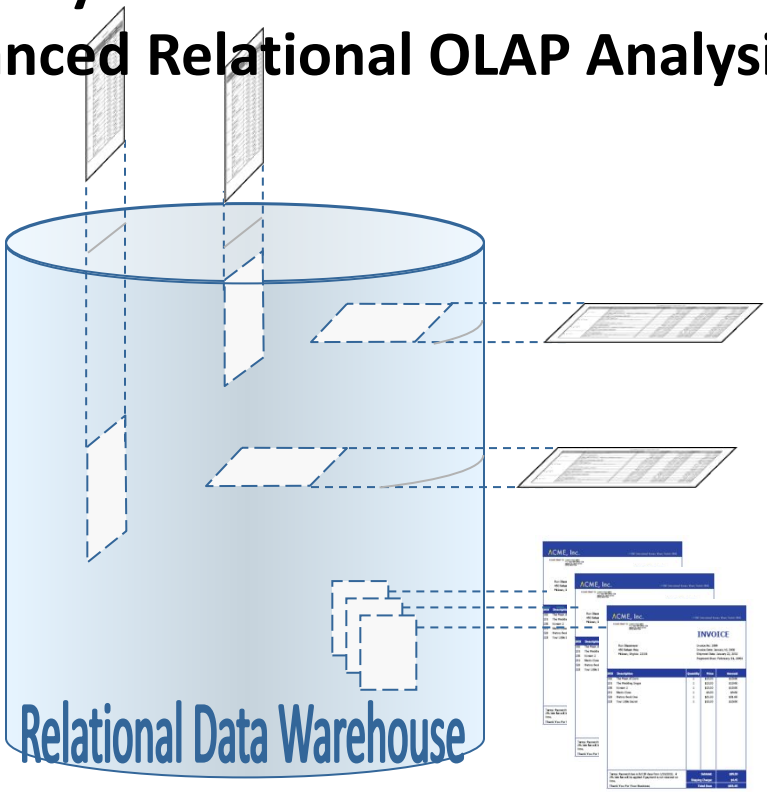
OLAP Analysis and Advanced ROLAP Analysis
MicroStrategy Satisfies All Analysis Needs

Slice and Dice with Basic OLAP Analysis



Single-click OLAP Manipulations Allow People To Slice-and-Dice a Subset of Data To View It from Many Different Perspectives

Drill Anywhere with Advanced Relational OLAP Analysis



Relational OLAP Architecture Allows People To 'Drill Anywhere' in The Entire Relational Database – Across All Dimensions and From Summary Level To Transactional-level Detail

Example: Olap Usage of an Automobile Marketer

The Story

An automobile marketer wants to improve business activity. Therefore he wants to view sales figures from different perspectives.

The Data Needs

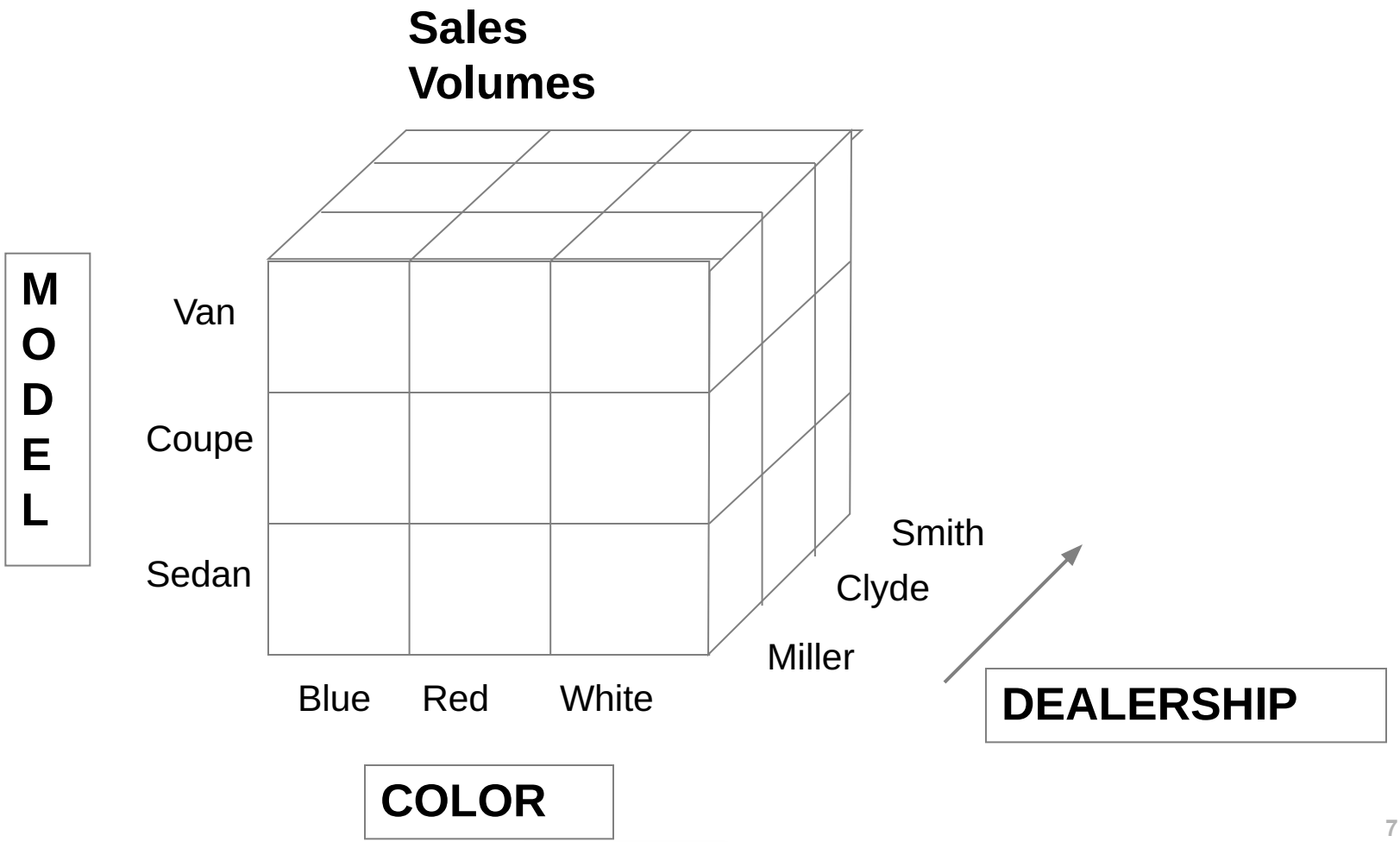
- Sales by model
- Sales by dealership
- Sales by color
- Sales over time
- etc.

A Question

What is the trend in sales volumes over a period of time for a specific model and color across a specific group of dealerships ?

Adopted from Teradata University Network presentation on OLAP.

Example: The Multidimensional View of the Data

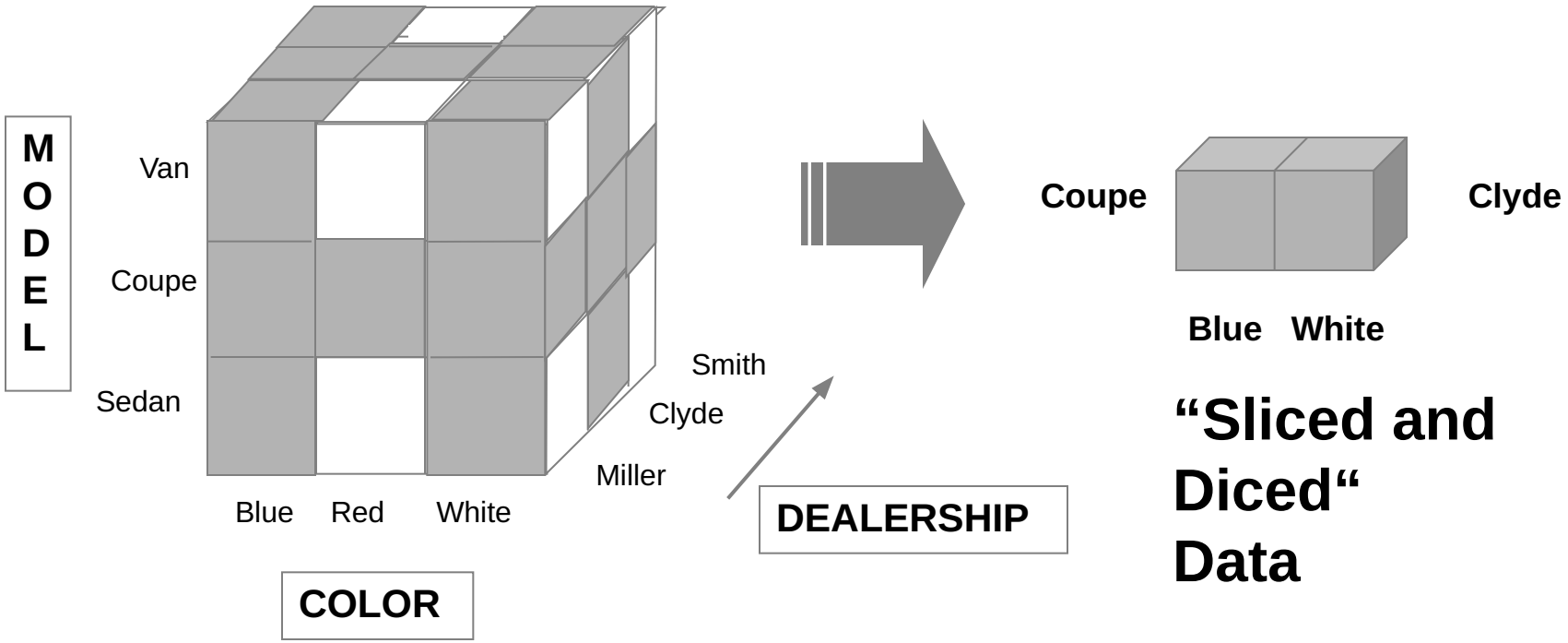


Adopted from Teradata University Network presentation on OLAP.

OLAP Features: “Slicing and Dicing“ the Data

Choosing a range out of each dimension:

- Color: Blue and White
- Model: Coupe only
- Dealership: Clyde only



Adopted from Teradata University Network presentation on OLAP.

OLAP Features: Rotating the Data

Different users will require different views of the multidimensional cube – OLAP allows easy rotation of data

Sales Volumes

MODEL	Blue	Red	White
Van			
Coupe			
Sedan			

COLOR

Rotate the data cube by 90°

Sales Volumes

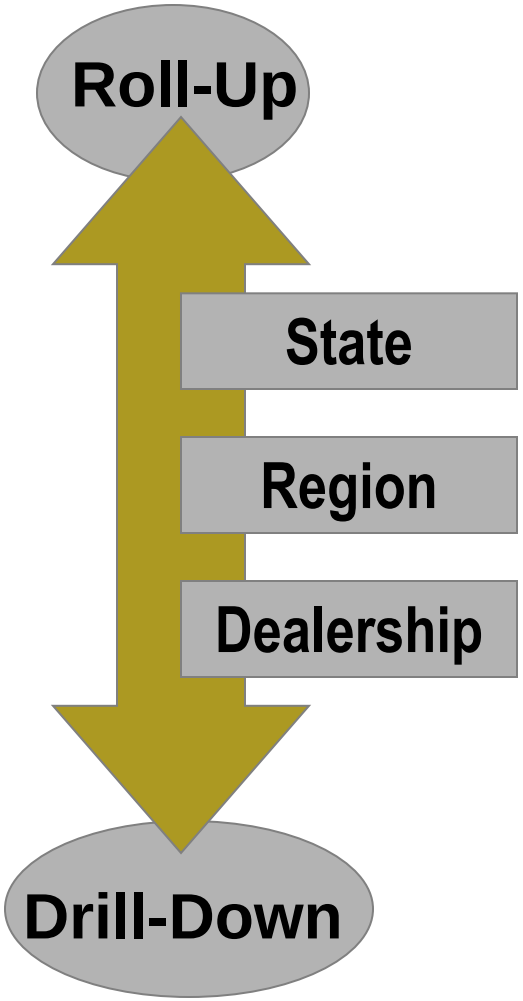
MODEL	Miller	Smith	Clyde
Van			
Coupe			
Sedan			

DEALERSHIP

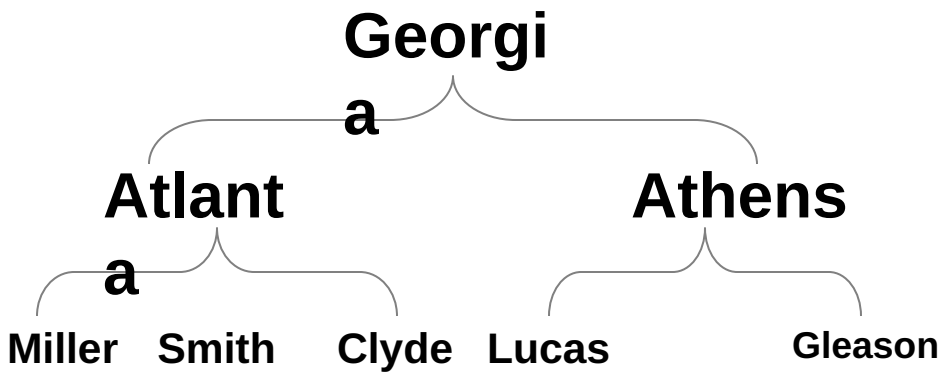
Adopted from Teradata University Network presentation on OLAP.

OLAP Features: Drill-Down and Roll-Up

Data can be disaggregated and aggregated along a dimension according to their natural hierarchy



Sales Volumes by Organization Dimension
- three level hierarchy -



Adopted from Teradata University Network presentation on OLAP.

OLTP versus OLAP

	OLTP	OLAP
User	Clerk, IT Professional	Knowledge Worker
Function	Day-to-day Operations	Decision Support
Database Design	Application-oriented (E-R based)	Subject-oriented (Star, Snowflake)
Data	Current, Isolated	Historical, Consolidated
View	Detailed, Flat Relational	Summarized, Multidimensional
Usage	Structured, Repetitive	Ad-Hoc
Unit of Work	Short, Simple Transaction	Complex Query
Access	Read / Write	Read Mostly
Operations	Index/Hash on Prim. Key	Lots of Scans
# Records Accessed	Tens	Millions
# Users	Thousands	Hundreds
Database Size	100s MB-GB	100s GB-TB
Performance Metric	Transaction Throughput	Query Throughput, Response

Adopted from Teradata University Network presentation on OLAP.