ONLINE ANALYTICAL PROCESSING (OLAP)

OVERVIEW

- *INTRODUCTION*
- *HISTORY OF OLAP*
- *OLAP CUBE*
- *DIFFERENCE BETWEEN OLAP & OLTP*
- *OLAP OPERATIONS*
- *ADVANTAGES & DISADVANTAGES*

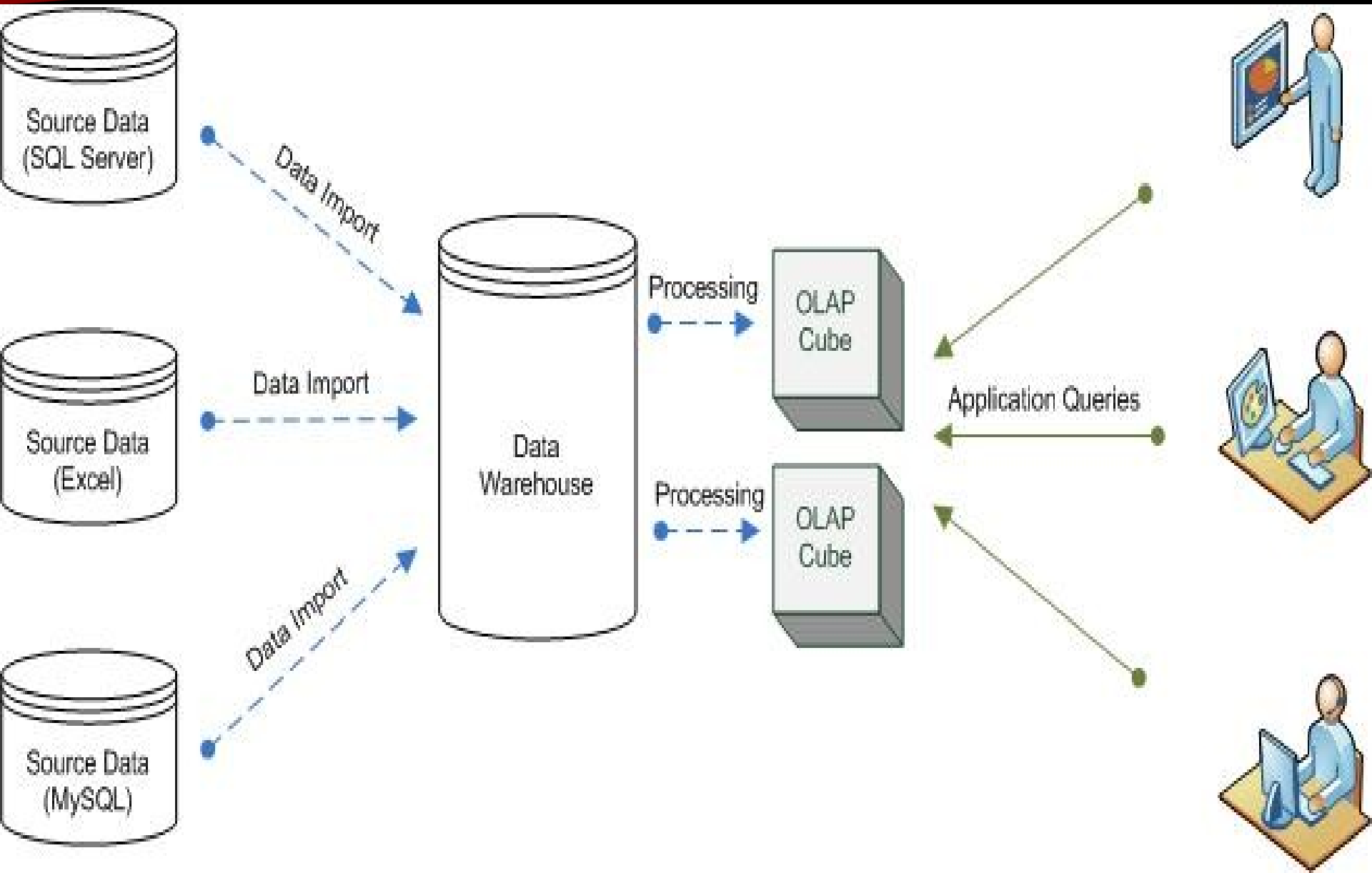
INTRODUCTION TO OLAP

- *OLAP (online analytical processing) is* **computer processing** *that enables a user to easily and selectively extract and view data from different points of view.*
- *OLAP allows users to* **analyze database information** *from multiple database systems at one time.*

HISTORY

- *In 1993, E. F. Codd came up with the term online analytical processing (OLAP) and proposed 12 criteria to define an OLAP database*
- *The term OLAP seems perfect to describe databases designed to facilitate decision making (analysis) in an organization*
- *The first product that performed OLAP queries was* **Express,** *which was* **released in 1970** *(and* **acquired** *by* **Oracle in 1995 from Information Resources***).*

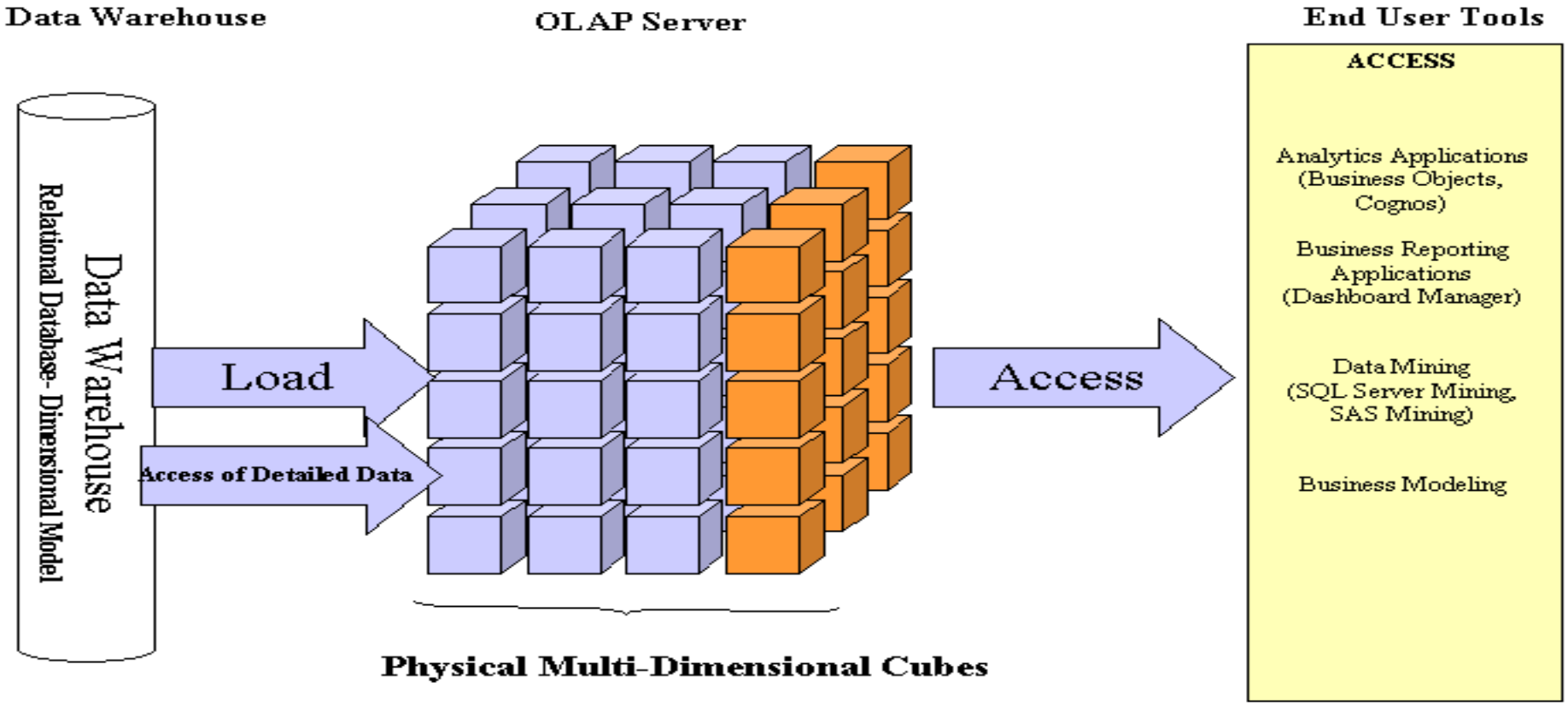
- *Some popular OLAP server software programs include:*
  - **Oracle Express Server**
  - **Hyperion Solutions Essbase**
- *OLAP processing is often used for* **data mining.**
- *OLAP products are* **typically designed for multiple-user environments**, *with the cost of the software based on the number of users.*


Source Data
(SQL Server)
Data Import
Source Data
(Excel)
Data Import
Source Data
(MySQL)
Data Import
Data
Warehouse
Processing
OLAP
Cube
Processing
OLAP
Cube
Application Queries

OLAP CUBE

- *An OLAP Cube is a data* **structure that allows fast analysis of data.**
- *The arrangement of data into cubes overcomes a limitation of relational databases.*
- *The OLAP cube consists of numeric facts called* **measures** *which are categorized by* **dimensions.**

OLAP CUBE


Data Warehouse
OLAP Server
End User Tools
Data Warehouse
Relational Database- Dimensional Model
Load
Access of Detailed Data
Access
ACCESS
Analytics Applications (Business Objects, Cognos)
Business Reporting Applications (Dashboard Manager)
Data Mining (SQL Server Mining, SAS Mining)
Business Modeling
Physical Multi-Dimensional Cubes

OLTP vs OLAP

- *Source of data*
- *Purpose of data*
- *Queries*
- *Processing speed*
- *Space Requirement*
- *Database Design*
- *Backup and Recovery*

OPERATIONS OF OLAP

- *There are different kind of operations which we can perform in OLAP*
- *Roll up*
- *Drill Down*
- *Slice*
- *Dice*
- *Pivot*
- *Drill-across*
- *Drill-through*

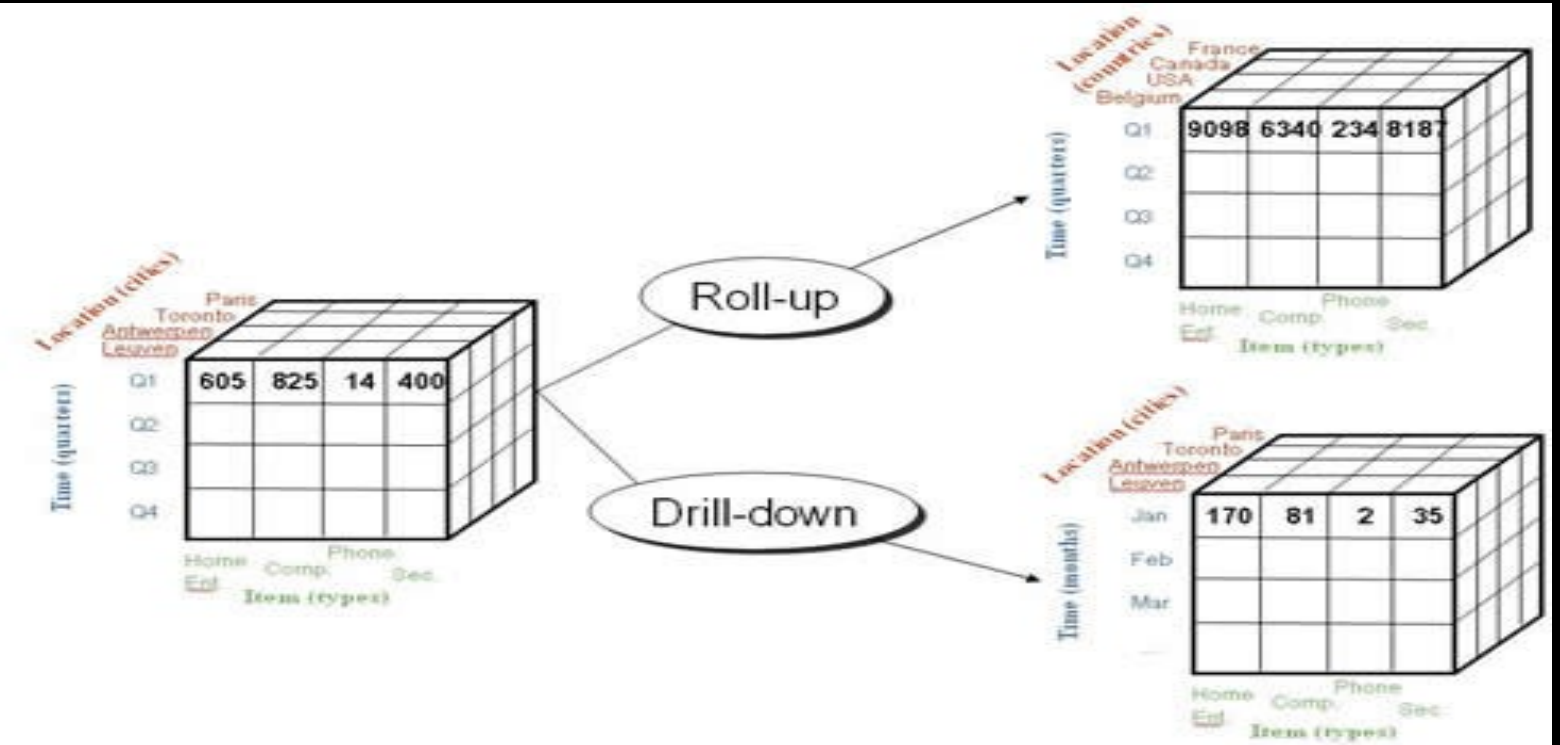
ROLL UP

- *Takes the current aggregation level of fact values and does a further aggregation on one or more of the dimensions.*
- *Equivalent to doing GROUP BY to this dimension by using attribute hierarchy.*

SELECT [attribute list], SUM [attribute names]
FROM [table list]
WHERE [condition list]
GROUP BY [grouping list];

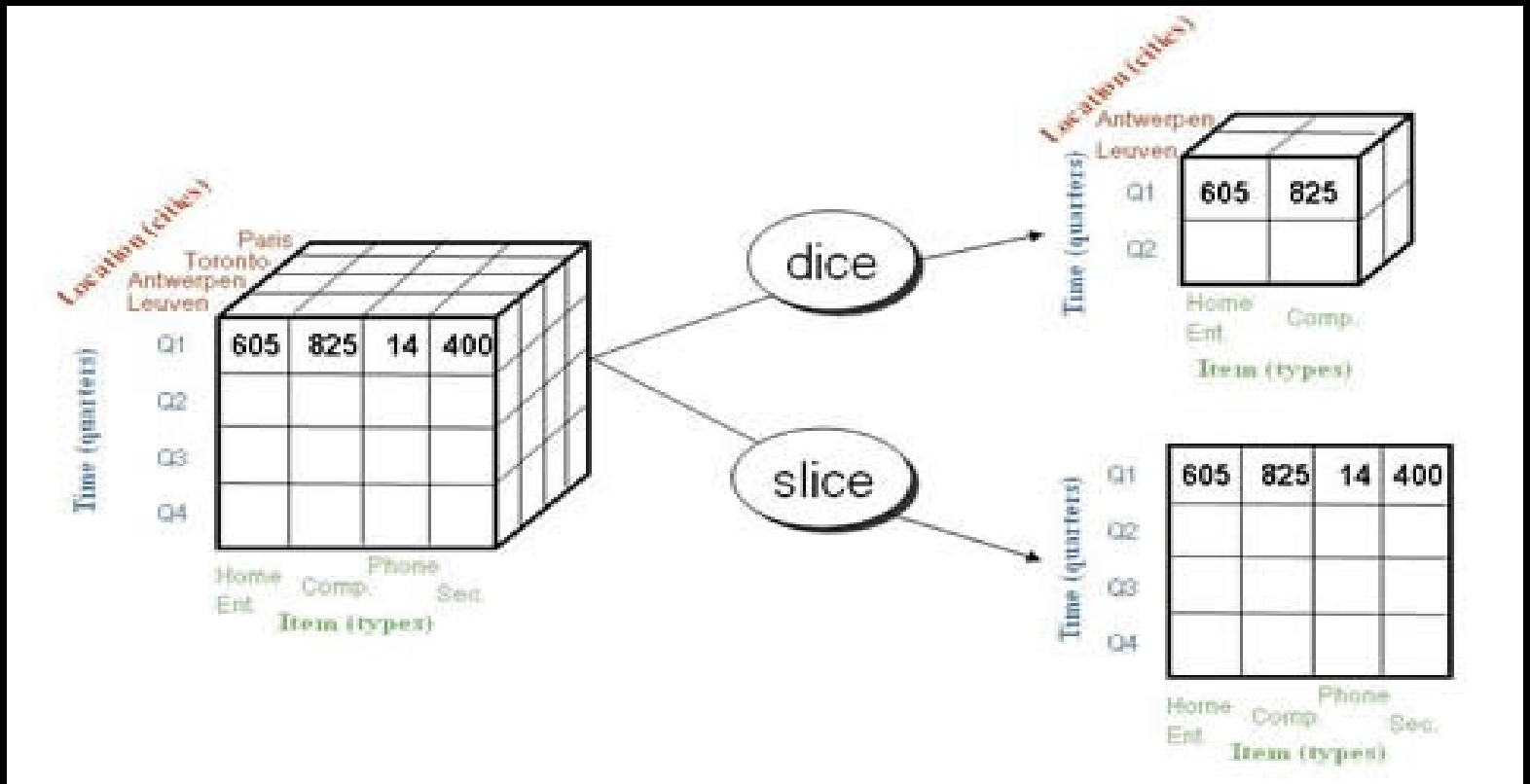
DRILL DOWN

- *Summarizes data at a lower level of a dimension hierarchy.*
- *Increases a number of dimensions - adds new headers*



SLICE

Performs a selection on one dimension of the given cube. Sets one or more dimensions to specific values and keeps a subset of dimensions for selected values.

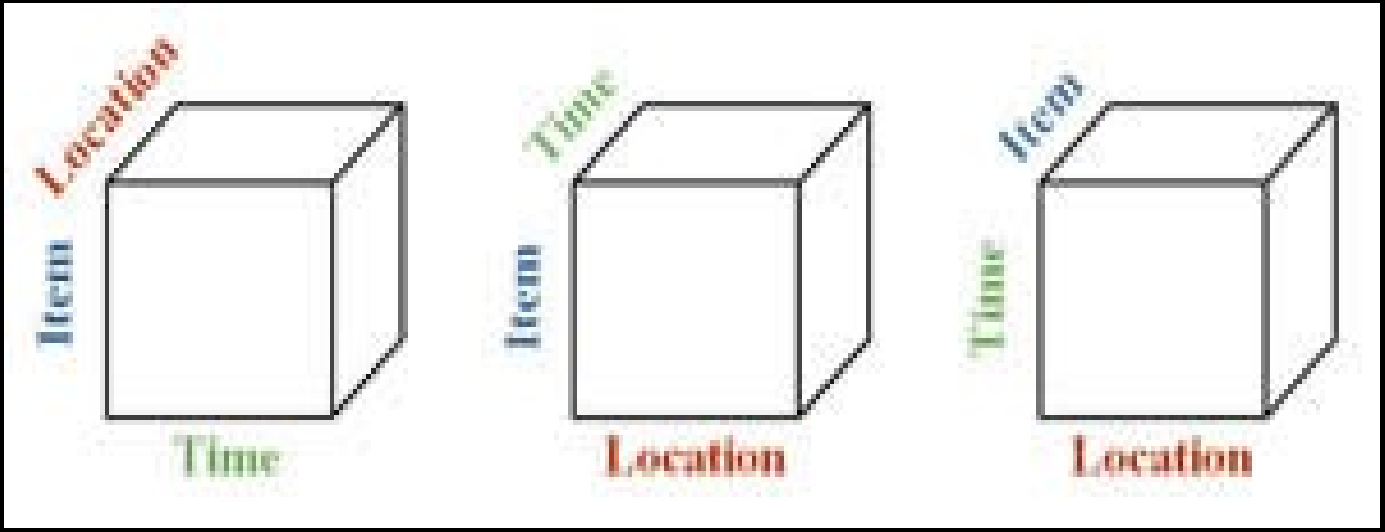


DICE

Define a sub-cube by performing a selection of one or more dimensions. Refers to range select condition on one dimension, or to select condition on more than one dimension. Reduces the number of member values of one or more dimensions.

PIVOT

- *Rotates the data axis to view the data from different perspectives.*
- *Groups data with different dimensions.*



DRILL-ACROSS AND DRILL-THROUGH

Drill-across : *Accesses more than one fact table that is linked by common dimensions. Combines cubes that share one or more dimensions.*

- ***Drill-through:*** *Drill down to the bottom level of a data cube down to its back-end relational tables.*

APPLICATIONS

- *Financial Applications*
- ✓*Marketing/Sales Applications*
- ✓*Business modeling*

ADVANTAGES

- *Consistency of Information and calculations*
- *What if" scenarios*
- *It allows a manager to* **pull down data** *from an OLAP database in broad or specific terms.*
- *OLAP creates a single platform for all the information and business needs, planning, budgeting, forecasting, reporting and analysis*

DISADVANTAGES

- *Pre-Modeling*
- *Great Dependence on IT*
- *Slow In Reacting*

PURPOSE OF OLAP

- *To derive summarized information from large volume database*
- *To generate automated reports for human view*

CONCLUSION

- *OLAP is a significant improvement over query systems*
- *OLAP is an interactive system to show different summaries of multidimensional data by interactively selecting the attributes in a multidimensional data cube*

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