OLAP Operations.

Online Analytical Processing Server (OLAP) is based on the multidimensional data model. It allows managers, and analysts to get an insight of the information through fast, consistent, and interactive access to information. This chapter cover the types of OLAP, operations on OLAP, difference between OLAP, and statistical databases and OLTP.

OLAP Operations

Since OLAP servers are based on multidimensional view of data, we will discuss OLAP operations in multidimensional data

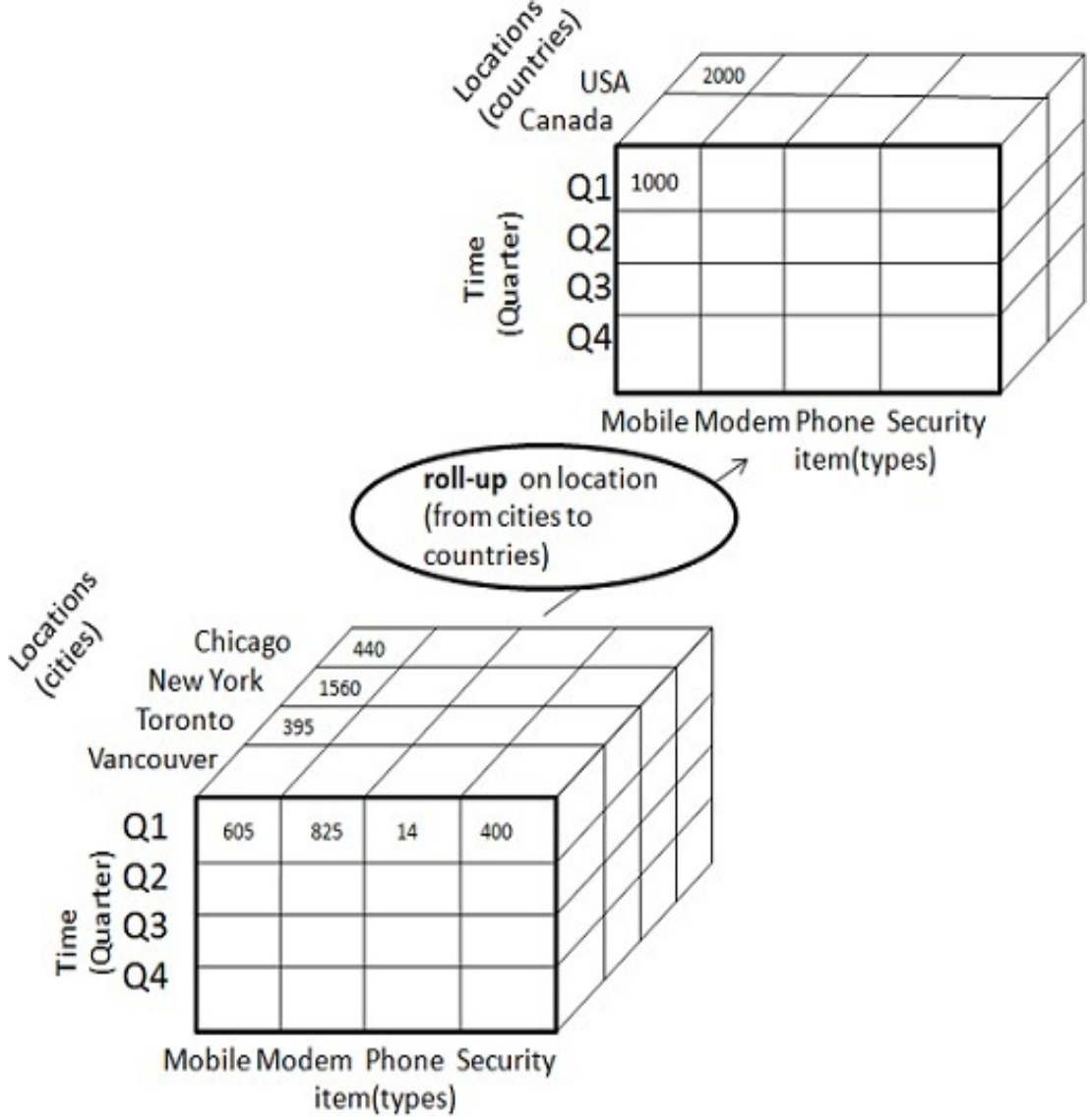
Some of OLAP operations −Roll-up,Drill-down,Slice and dice,Pivot (rotate)

Roll-up

Roll-up performs aggregation on a data cube in any of the following ways −
i)By climbing up a concept hierarchy for a dimension

ii)By dimension reduction

Roll-up is performed by climbing up a concept hierarchy for the dimension location.
Initially the concept hierarchy was "street < city < province < country".
On rolling up, the data is aggregated by ascending the location hierarchy fromthe level of city to the level of country.
The data is grouped into cities rather than countries.
When roll-up is performed, one or more dimensions from the data cube are removed.

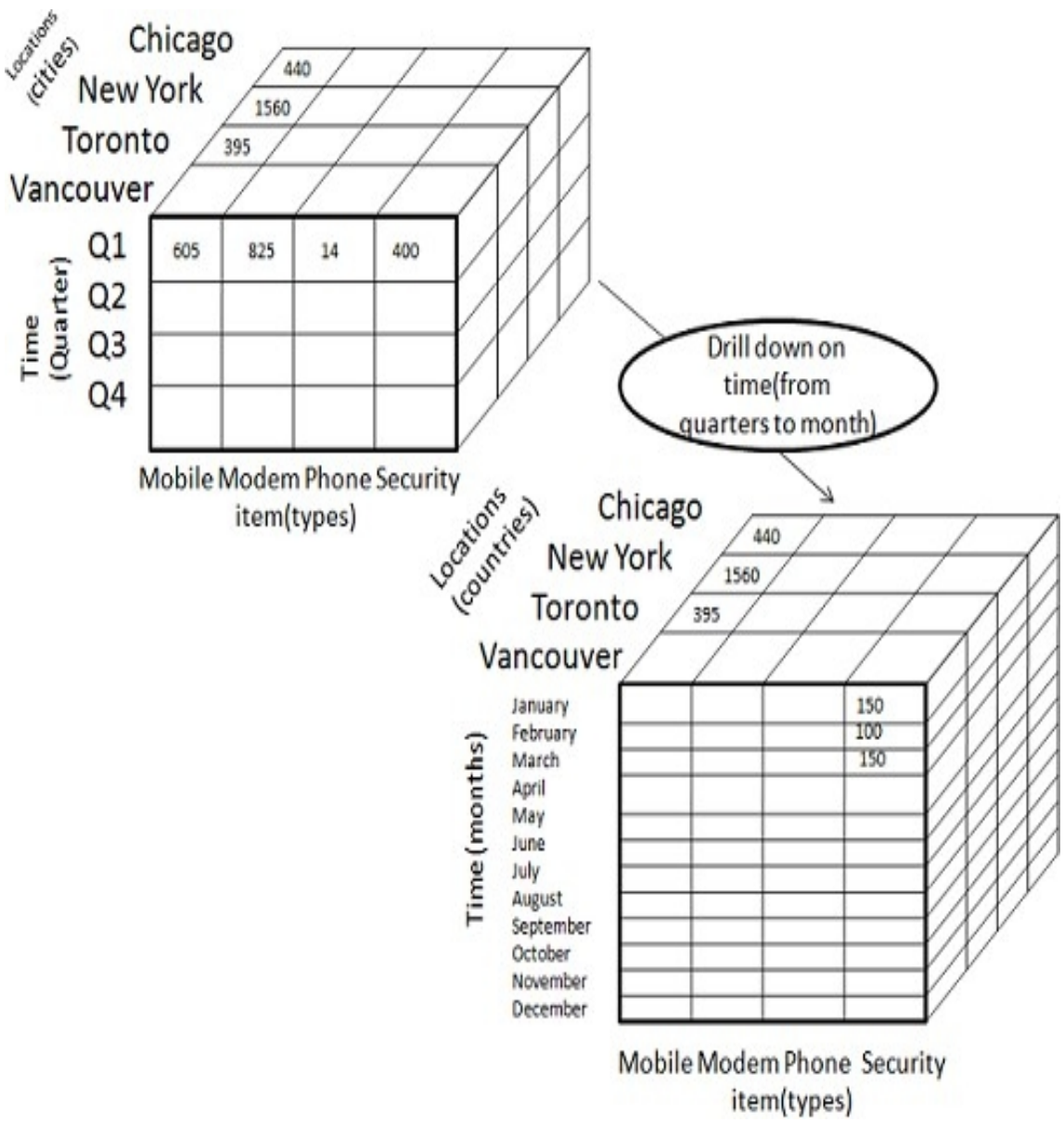


Drill-down

Drill-down is the reverse operation of roll-up. It is performed by either of the followingways −
i)By stepping down a concept hierarchy for a dimension

ii)By introducing a new dimension.

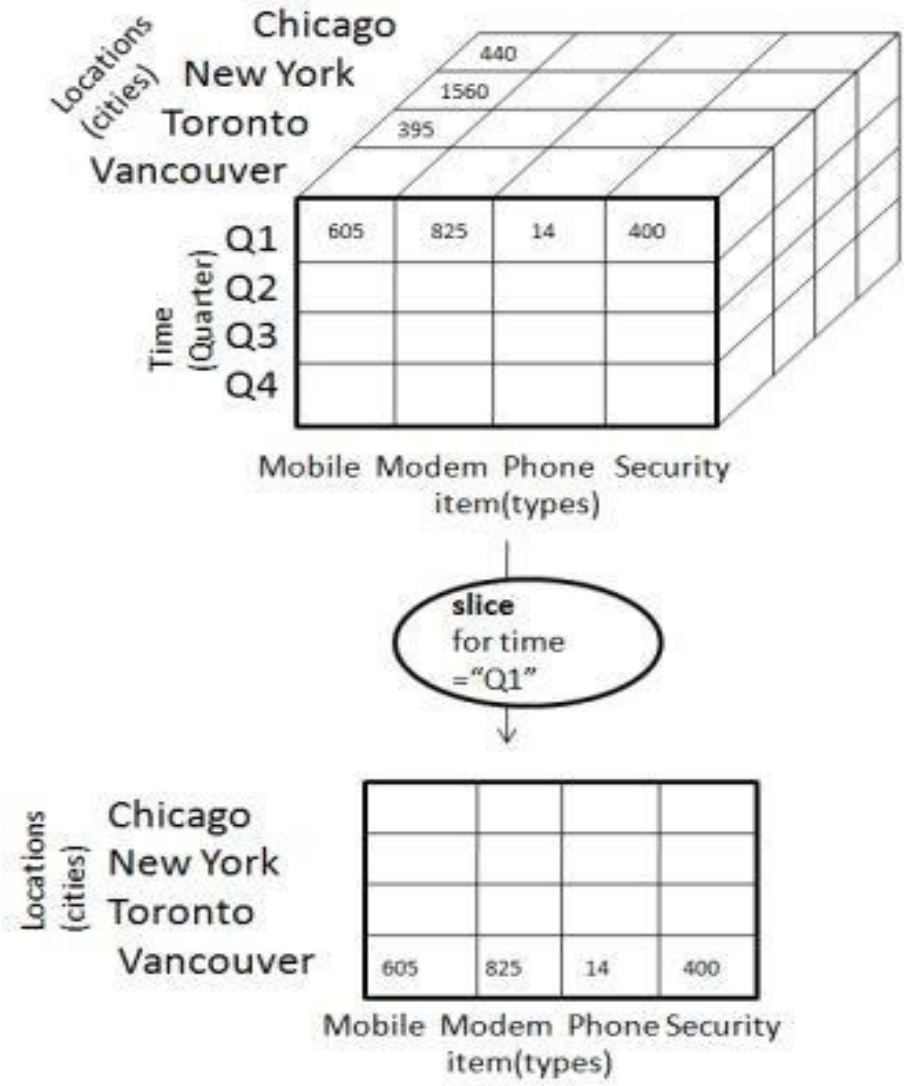
The following diagram illustrates how drill-down works –



Drill-down is performed by stepping down a concept hierarchy for the dimension time.Initially the concept hierarchy was "day < month < quarter < year."
On drilling down, the time dimension is descended from the level of quarter to the level of month.
When drill-down is performed, one or more dimensions from the data cube are added.It navigates the data from less detailed data to highly detailed data.

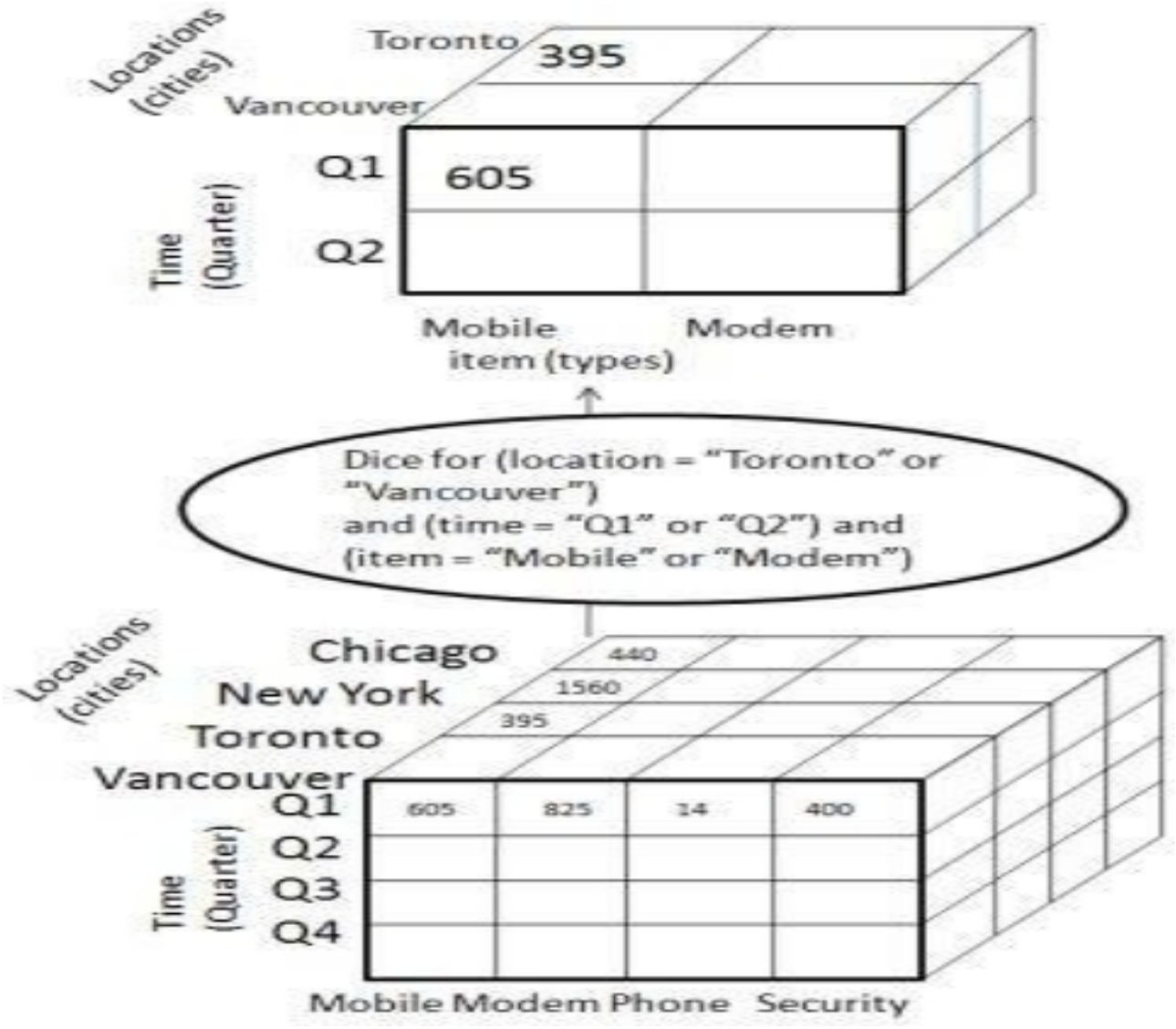
Slice

The slice operation selects one particular dimension from a given cube and providesa new sub-cube. Consider the following diagram that shows how slice works
Here Slice is performed for the dimension "time" using the criterion time = "Q1".
It will form a new sub-cube by selecting one or more dimensions.



Dice-

Dice selects two or more dimensions from a given cube and provides a new sub-cube.Consider the following diagram that shows the dice operation.



The dice operation on the cube based on the following selection criteria involves threedimensions.

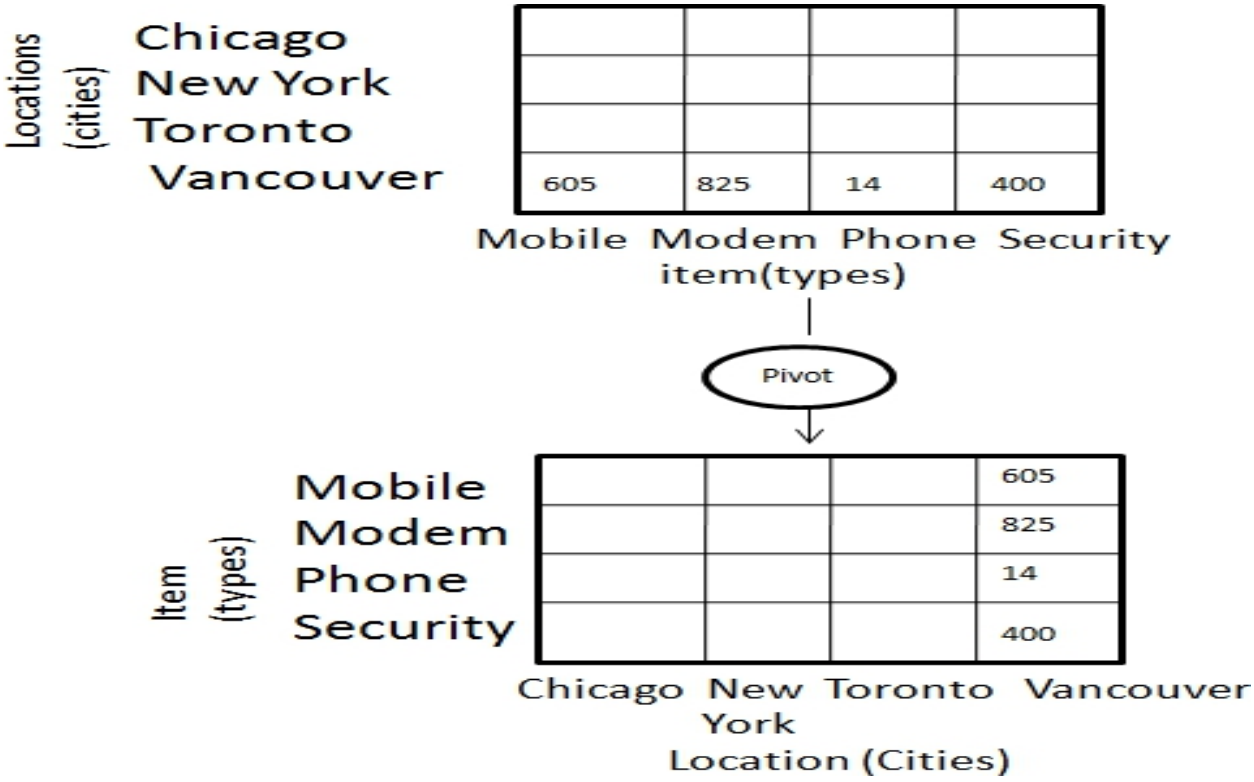
(location = "Toronto" or "Vancouver")

(time = "Q1" or "Q2")

(item =" Mobile" or "Modem")

Pivot

The pivot operation is also known as rotation. It rotates the data axes in view in order to provide an alternative presentation of data. Consider the following diagram that shows thepivot operation.


Locations (cities)
Chicago
New York
Toronto
Vancouver
605
825
14
400
Mobile Modem Phone Security
item(types)
Pivot
Item (types)
Mobile
Modem
Phone
Security
605
825
14
400
Chicago New York Toronto Vancouver
Location (Cities)