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DMW - Experiment 7

Aim: Perform OLAP operations such as Roll up, Drill down, Slice and Dice, Pivot on Datawarehouse.

Theory:

OLAP is an acronym for On Line Analytical Processing. Online Analytical Processing: An OLAP system manages large amount of historical data, provides Facilities for summarization and aggregation, and stores and manages information at different levels of granularity.

OLAP operations:

Slice: A slice is a subset of a multi-dimensional array corresponding to a single value for one or more members of the dimensions not in the subset.
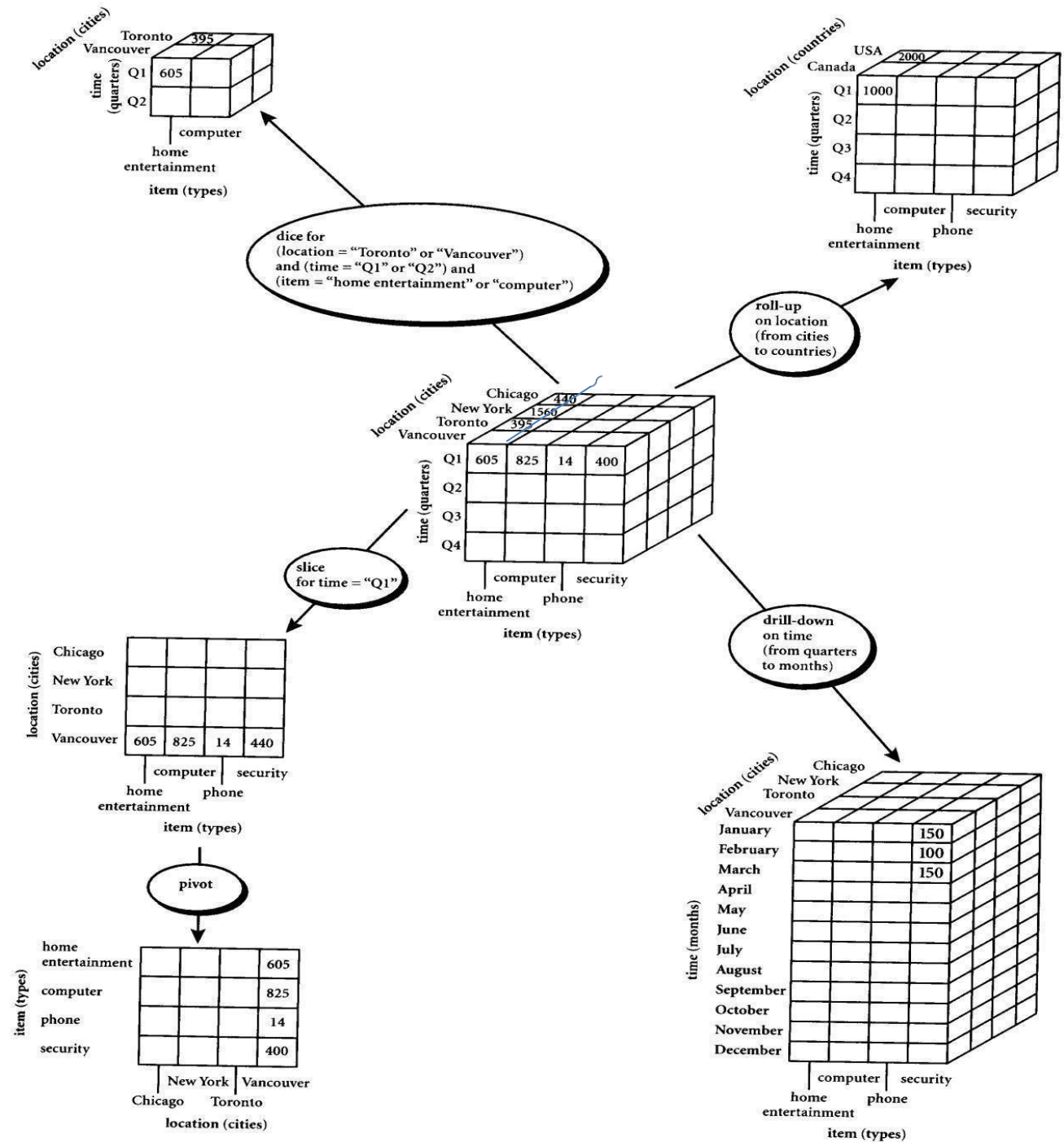
Dice: The dice operation is a slice on more than two dimensions of a data cube (or more than two consecutive slices).

Drill Down/Up: Drilling down or up is a specific analytical technique whereby the user navigates among levels of data ranging from the most summarized (up) to the most detailed (down).

Roll-up: A roll-up involves computing all of the data relationships for one or more dimensions.

To do this, a computational relationship or formula might be defined.

Pivot: To change the dimensional orientation of a report or page display.

location (cities)
Toronto 395
Vancouver
time (quarters) Q1 605
Q2
computer
home entertainment
item (types)

dice for
(location = "Toronto" or "Vancouver")
and (time = "Q1" or "Q2") and
(item = "home entertainment" or "computer")

location (countries)
USA 2000
Canada
time (quarters) Q1 1000
Q2
Q3
Q4
computer security
home entertainment phone
item (types)

roll-up
on location
(from cities
to countries)

location (cities)
Chicago 440
New York 1560
Toronto 395
Vancouver
time (quarters) Q1 605 825 14 400
Q2
Q3
Q4
computer security
home entertainment phone
item (types)

slice
for time = "Q1"

location (cities)
Chicago
New York
Toronto
Vancouver 605 825 14 440
computer security
home entertainment phone
item (types)

pivot

item (types)
home entertainment 605
computer 825
phone 14
security 400
New York Vancouver
Chicago Toronto
location (cities)

drill-down
on time
(from quarters
to months)

location (cities)
Chicago
New York
Toronto
Vancouver
time (months)
January 150
February 100
March 150
April
May
June
July
August
September
October
November
December
computer security
home entertainment phone
item (types)

EXERCISE 1

Consider a data Warehouse for a hospital, where there are three dimensions:

  (i)   Doctor

  (ii)   Patient

  (iii) Time

         With two measures

         (a) Count

         (b) Charge

         Where Charge is the fee that the Doctor charges a patient for a visit.

         Using the above example describe the following operations:

         (i)   Slice

         (ii)   Dice

         (iii) Roll Up

         (iv)   Drill Down (v) Pivot

NOTE: Assume data according to the dimensions and measures and explore individual tasks diagrammatically.

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DMW – Experiment 1

Exercise 1 :

	(Doctor) D4	250	150	400	100
	D3	300	500	350	240
	D2	200	280	180	170
	D1				

(Time)		P1	P2	P3	P4
	Q1	100	180	135	200
	Q2	200	0	300	100
	Q3	150	530	280	370
	Q4	50	370	110	0

(Patient)

Slice :

D4	250	150	400	100
D3	300	500	350	240
D2	200	280	180	170
D1				
Q1	100	180	135	200

P1   P2   P3   P4

Dice :

D2	200	280
Q1		

	P1	P2
Q1	100	180
Q2	200	0

P1   P2

Roll up :

	P1	P2	P3	P4
(top)	550	550	700	340
Q1	300	480	305	370
Q2	200	0	300	150
Q3	150	530	280	330
Q4	50	270	100	0

Drill down :

D4	250	150	400	110
D3	300	500	350	240
D2	200	280	100	170

D1	P1	P2	P3	P4
January	70	90	75	100
February	15	23	45	50
March	15	45	25	50
April	50	0	180	75
May	100	0	150	25
June	50	0	50	50
July	500	200	70	100
August	50	100	140	200
September	50	230	70	70
October	10	90	50	0
November	20	100	30	0
December	20	80	20	0

Pivot :

	D1	D2	D3	D4
P1	100	200	300	250
P2	180	280	500	150
P3	125	180	350	400
P4	200	140	240	100

EXERCISE 2

To create Pivot of Table using MS Excel

Follow these steps …

1. Start with M.S Excel.

2. In excel sheet create 4 columns PRODUCT, ORIGIN, DAY OF SALE, SOLD UNITS (FACT COLUMN).

3. Insert around fifty rows of data.

4. Save the table data.

5. Go to Insert Tab-> click on Pivot Table-> New work sheet-> Ok.

6. Right side you will find pivot table fields.

   It contains all columns of our table that we created.

   Select product in rows,

   Days in column,

   Unit sold in $\sum$ values.

   Later apply filter using Origin.

   Also, we can flip the rows & columns or combine together as rows only to see different views of same data.

   Dataset:

	A	B	C	D
	PRODUCT	ORIGIN	DAY OF SALE	SOLID UNITS
	A	East	01-01-2023	8
	B	Central	02-01-2023	4
	C	Central	03-01-2023	2
	D	Central	04-01-2023	5
	E	West	05-01-2023	6
	F	East	06-01-2023	9
	G	Central	07-01-2023	9
	H	Central	08-01-2023	1
	I	West	09-01-2023	1
	J	East	01-01-2023	8
	K	Central	02-01-2023	4
	L	East	03-01-2023	6
	M	East	04-01-2023	7
	N	East	05-01-2023	9
	O	Central	06-01-2023	5
	P	East	07-01-2023	2
	Q	Central	08-01-2023	1
	R	East	09-01-2023	3
	S	East	01-01-2023	6
	T	Central	02-01-2023	5
	U	Central	03-01-2023	8
	V	East	04-01-2023	4
	X	Central	05-01-2023	8
	Y	Central	06-01-2023	9
	Z	East	07-01-2023	2

PivotTable Fields ▾ ✕

Choose fields to add to report: ⚙ ▾

Search 🔍

☑ **PRODUCT**
☑ **ORIGIN**
☑ **DAY OF SALE**
☑ **SOLID UNITS**
More Tables...

Drag fields between areas below:

▼ Filters

| ORIGIN ▾ |

▥ Columns

| DAY OF SALE ▾ |

≡ Rows

| PRODUCT ▾ |

Σ Values

| Sum of SOLID UNITS ▾ |

ORIGIN	East ▾

Sum of SOLID UNITS	Column Labels ▾						
Row Labels ▾	01-01-2023	03-01-2023	04-01-2023	05-01-2023	06-01-2023	07-01-2023	09-01-2023	Grand Total
A	8							8
F					9			9
J	8							8
L		6						6
M			7					7
N				9				9
P						2		2
R							3	3
S	6							6
V			4					4
Z						2		2
Grand Total	22	6	11	9	9	4	3	64

Conclusion: Thus, we performed various OLAP instructions.