

Tutorial 11: An Introduction to SQL Server Analysis Services and Data Warehousing

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1 Deliverable 1

User would like to use **drill down** to see the contribution to the total sales for a specific kind of product, or a specific category of products. An example question that drill down can answer is “In my total sales, how much does Washington Apple Juice contribute to the sales?”

User would like to use **roll up** to see the summarized statistics, such as total sales and total expenses. An example question that roll up can answer is “Given the salary of each employee, how much does the company pay in total for all the salaries?”

2 Deliverable 2

Drill down on the drink products and find *Washington Apple Juice*

1. The grand total of all daily unit sales is **426**.
2. (a) **Sunday** has the highest number of sales for that product.
 - Monday 71
 - Tuesday 50
 - Wednesday 51
 - Thursday 48
 - Friday 51
 - Saturday 58
 - Sunday 97(b) The sales are **not** evenly distributed. Sunday and Monday have significantly higher sales than the rest of the week. Sunday and Monday are the days when people usually do grocery so the sales are higher.
3. A business want to track the total number of unit sales on a particular day to determine how many sales they made on that day. For example, if the business has a promotion event on that particular day, the business would like to measure how effective the promotion is by counting the total sales on that day.
4. A business want to identify outliers because they don't want to make business decisions imprecisely on these outliers. For example, Washington Apple Juice is very unpopular in a retail shop. One day, some tourists who happen to travel to the city and go into the shop and buys all the Washington Apple Juice – this outlier data should be excluded because the Washington Apple Juice is unpopular for the shop's daily customers so the shop should not increase the stock.

3 Deliverable 3

The Data Cube is specified in the “FROM” clause in MDX; the drill down dimensions and filter expressions are specified in the “ON COLUMNS” clause in MDX; the measures we would like to see are specified in the “ON ROWS” clause in MDX.

The MDX query results are a drill-down of the total unit sales in the Data Cube from Step 4. It drills down the total unit sales to three categories — drink, food, and non-consumable.

4 Deliverable 4

My user id is: f4a0b

ect Explorer

connect

FoodMart 2008_a1k0b

FoodMart 2008_a1x0b

FoodMart 2008_a4d5

FoodMart 2008_a8l0b

FoodMart 2008_b2q0b

FoodMart 2008_b3l0b

FoodMart 2008_b4n0b

FoodMart 2008_b4u9a

FoodMart 2008_b9h0b

FoodMart 2008_c2a1b

FoodMart 2008_c3k0b

FoodMart 2008_c4n0b

FoodMart 2008_c5m0b

FoodMart 2008_c6f0b

FoodMart 2008_cs304

FoodMart 2008_cs304_test

FoodMart 2008_d3l6

FoodMart 2008_e0a0b

FoodMart 2008_e3n6

FoodMart 2008_e5e0b

FoodMart 2008_e9r0b

FoodMart 2008_e9u0b

FoodMart 2008_f4a0b

Data Sources

Data Source Views

Cubes

Dimensions

Mining Structures

Roles

Assemblies

MDXQuery1.mdx - ...0b (CS-USE\F4a0b)*

Cube: Budget

Metadata Functions

Search Model

Measure Group: <All>

Budget

Measures

KPIs

Account

Category

Currency

Customer

Product

Promotion

Store

Time

Warehouse

SELECT { Drink, Food, [Non-Consumable] } ON COLUMNS,
{ Measures.[Unit Sales], Measures.[Store Cost] } ON ROWS
FROM [Warehouse and Sales]

100 %

Messages Results

| | Drink | Food | Non-Consumable |
|------------|------------------|------------------|----------------|
| Unit Sales | 71551 | 557863 | 147346 |
| Store Cost | 56975.9036000001 | 475264.365400003 | 125952.6935 |

5 Deliverable 5

a) Query Unit Sales and Store Cost of "Drink".

Sales and Employees

Metadata

Measure Group: <All>

Sales and Employees

Measures

Sales

Sales Count

Store Cost

Store Sales

Unit Sales

Profit

KPIs

Dimension

Product

<Select dimension>

Unit Sales

Store Cost

71551

56975.9036000001

Hierarchy

Products

Operator

Equal

Filter Expression

{ Drink }

b) Query Unit Sales and Store Cost of "Food".

| | | | |
|------------------------|--------------------|-----------|----------|
| Edit as Text Import... | | | |
| Sales and Employees | Dimension | Hierarchy | Operator |
| Metadata | Product | Products | Equal |
| Measure Group: | Filter Expression | | |
| <All> | <Select dimension> | | |
| Sales and Employees | | | |
| Measures | | | |
| Sales | | | |
| Sales Count | | | |
| Store Cost | | | |
| Store Sales | | | |
| Unit Sales | | | |
| Profit | | | |
| KPIs | | | |
| Currency | | | |
| Customer | | | |

| Unit Sales | Store Cost |
|------------|-------------|
| 557863 | 475264.3654 |

c) Query Unit Sales and Store Cost of "Non-Consumable".

| | | | |
|------------------------|--------------------|-----------|----------|
| Edit as Text Import... | | | |
| Sales and Employees | Dimension | Hierarchy | Operator |
| Metadata | Product | Products | Equal |
| Measure Group: | Filter Expression | | |
| <All> | { Non-Consumable } | | |
| Sales and Employees | | | |
| Measures | | | |
| Sales | | | |
| Sales Count | | | |
| Store Cost | | | |
| Store Sales | | | |
| Unit Sales | | | |
| Profit | | | |
| KPIs | | | |
| Currency | | | |
| Customer | | | |

| Unit Sales | Store Cost |
|------------|-------------|
| 147346 | 125952.6935 |

6 Deliverable 6

Choose (a) – creating and running an MDX query

```
SELECT { [Bachelor Degree], [Graduate Degree], [High School Degree] } ON COLUMNS,
       { Measures.[Employee Count], Measures.[Overtime Count] } ON ROWS
FROM   [HR]
```

MDXQuery1.mdx -...0b (CS-USE\F4a0b)*

```

SELECT { [Bachelors Degree], [Graduate Degree], [High School Degree] } ON COLUMNS,
{ Measures.[Employee Count], Measures.[Overtime Hours] } ON ROWS
FROM [HR]

```

| | Bachelors Degree | Graduate Degree | High School Degree |
|----------------|------------------|-----------------|--------------------|
| Employee Count | 287 | 170 | 281 |
| Overtime Hours | 71325 | 45310 | 70544 |

Explanation:

This query result answers the question “How does education level of employees affect their overtime hours”. We can see that 287 Bachelor employees work 71325 overtime hours – on average 249 hours/employee; 170 Graduate employees work 45310 overtime hours – on average 267 hours/employee; 281 High School employees work 70544 overtime hours – on average 251 hours/employee. So employees with Graduate degrees tend to work overtime more often.

7 Deliverable 7

I drilled down on the sales of soda drinks categorized by different brands and different quarters of year 1997.

| Page Layout Formulas Data Review View ACROBAT TEAM Analyze Design Tell me what you want to do... | | | | | | | | | | | | | |
|--|--|---------------|------------|------------|------------|------------|------------|------------|------------|--|-----------------|-----------------|-------------|
| Font Alignment Number Styles | | | | | | | | | | | | | |
| Q1 | | | | | | | | | | | | | |
| | | Column Labels | | | | | | | | | | | |
| | | 1997 | | | | | | | | | 1997 Store Cost | 1997 Unit Sales | 1998 |
| | | Q1 | Q2 | Q3 | Q4 | | | | | | | | Total |
| Row Labels | | Store Cost | Unit Sales | Store Cost | Unit Sales | Store Cost | Unit Sales | Store Cost | Unit Sales | | | | |
| Drink | | 4621.5034 | 5976 | 4728.4702 | 5895 | 4790.6555 | 6065 | 5336.6055 | 6661 | | 19477.2346 | 24597 | 37498.669 |
| Alcoholic Beverages | | 1223.8054 | 1567 | 1389.208 | 1699 | 1363.9471 | 1696 | 1599.8247 | 1876 | | 5576.7852 | 6838 | 10856.6715 |
| Beverages | | 2701.4871 | 3333 | 2694.5243 | 3267 | 2753.9212 | 3376 | 2919.5976 | 3597 | | 11069.5302 | 13573 | 20920.8036 |
| Carbonated Beverages | | 580.8618 | 789 | 642.2198 | 856 | 637.0986 | 882 | 624.4247 | 880 | | 2484.6049 | 3407 | 4576.2731 |
| Soda | | 580.8618 | 789 | 642.2198 | 856 | 637.0986 | 882 | 624.4247 | 880 | | 2484.6049 | 3407 | 4576.2731 |
| Excellent | | 128.0635 | 174 | 133.3952 | 192 | 141.737 | 211 | 106.8414 | 161 | | 510.0371 | 738 | 929.7798 |
| Fabulous | | 111.5542 | 131 | 142.3873 | 168 | 121.9582 | 155 | 134.3854 | 178 | | 510.2851 | 632 | 999.3423 |
| Skinner | | 107.4942 | 161 | 124.2646 | 167 | 136.5695 | 153 | 132.5334 | 174 | | 500.8617 | 655 | 932.874 |
| Token | | 91.9347 | 180 | 70.3428 | 152 | 84.2495 | 195 | 101.4649 | 208 | | 347.9919 | 735 | 630.4905 |
| Washington | | 141.8152 | 143 | 171.8299 | 177 | 152.5844 | 168 | 149.1996 | 159 | | 615.4291 | 647 | 1083.7865 |
| Drinks | | 538.2722 | 617 | 524.6467 | 569 | 525.0815 | 562 | 659.1089 | 721 | | 2247.1093 | 2469 | 4528.2262 |
| Hot Beverages | | 927.6067 | 1090 | 907.3009 | 1037 | 899.8629 | 1037 | 973.3142 | 1137 | | 3708.0847 | 4301 | 6774.0422 |
| Pure Juice Beverages | | 654.7464 | 837 | 620.3569 | 805 | 691.8782 | 895 | 662.7498 | 859 | | 2629.7313 | 3396 | 5042.2621 |
| Dairy | | 696.2109 | 1076 | 644.7379 | 929 | 672.7872 | 993 | 817.1832 | 1188 | | 2830.9192 | 4186 | 5721.1939 |
| Food | | 40446.8486 | 47809 | 38112.6264 | 44825 | 40545.0527 | 47440 | 44166.1958 | 51866 | | 163270.7235 | 191940 | 311993.6419 |
| Non-Consumable | | 10683.8885 | 12506 | 10123.1282 | 11890 | 10569.1612 | 12343 | 11503.0976 | 13497 | | 42879.2755 | 50236 | 83073.418 |
| Grand Total | | 55752.2405 | 66291 | 52964.2248 | 62610 | 55904.8694 | 65848 | 61005.8989 | 72024 | | 225627.2336 | 266773 | 432565.7289 |