

## MDX (Multidimensional Expressions)

MDX statement has a very simple composition:

```
SELECT axis [,axis]  
FROM cube  
WHERE  slicer [,slicer]
```

The SELECT clause is used to define *axis* dimensions and the WHERE clause is used to supply *slicer* dimensions, and *cube* is the name of the cube. Don't leave the FROM clause empty.

### The Axis Dimensions in the SELECT Clause

If the cube is viewed as an n-dimension data structure, this clause specified the edge(s) of the cube to return. The basic structure of the SELECT clause is:

```
SELECT set ON axis_name,  
       set ON axis_name,  
       set ON axis_name
```

where *axis\_name* can be COLUMNS or ROWS

### The Slicers in the WEHRE Clause

The slicer dimensions contain the single members with which the cube is filtered or "sliced".

### The Contents of the Axes

.member – A member is an item in a dimension and corresponds to a specific piece of data. For example:

```
[Time].[1997]  
[Customers].[All Customers].[Mexico].[Mexico]  
[Product].[All Products].[Drink]
```

.tuple – A tuple is a collection of members from different dimensions. For example:

```
([Time].[1997], [Product].[All Products].[Drink])  
(1997, Drink)  
(1997, [Customers].[All Customers].[Mexico].[Mexico])
```

.set – A set is a collection of tuples. For example:

```
{[Time].[1997], [Time].[1998], [Time].[1999]}
```

{1997, 1998, 1999}  
{1990:1999} (The colon(☺ is an inclusive range.)  
{{1997, Drink}, (1998, Drink)}

### The Data Hierarchy

Data within a cube is divided into the following relationships:

#### Dimensions

Hierarchies  
Levels  
Members

For example:

Product	Dimension
Function	Hierarchy
Product Family	Level
Drink	Member
Food	Member
Non-Consumable	Member

#### MDX Functions and Expressions:

Function refers to a specific operation being performed on some set of data (Sum(), TopCount()). Expression describe syntax in which the function is placed after the cube parameter ([1997].children, [Products].DefaultMember).

#### The .Members Expression

This expression is used to retrieve a set of enumerated members from a dimension, hierarchy, or level. For example:

dimension.Members  
hierarchy.Members  
level.Members

#### The CrossJoin() Function:

The CrossJoin() function is used to generate the cross-product of two input sets. If two sets exists in two independent dimensions, the CrossJoin operator creates a new set consisting of all of the combinations of the members in the two dimensions as follows:

crossjoin (set1, set2)

#### The TopCount() and BottomCount() Functions:

These expressions sort a set based on a numerical expression and pick the top index

items based on rank order as follows:

TopCount (set, index, numeric expression)

BottomCount (set, index, numeric expression)

The Filter() Function

The Filter() function is used to filter a set based on a particular condition as follows:

Filter (set, search condition)

The Order() Function

The Order() function provides sorting capabilities within the MDX language as follows:

Order (set, string expression [, ASC | DESC | BASC | BDESC])

or

Order (set, numeric expression [, ASC | DESC | BASC | BDESC])