



OLAP universes best practices

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1 Introduction

XI R3.0 has been released in Q4 2007 with a high priority on OLAP data sources and especially on Netweaver BI.

Many people are very familiar with the Semantic Layer on relational data sources but have not the same skill level on OLAP data.

This document aims to provide a list of best practices and especially on how to enrich an OLAP universe.

This document is especially focusing on SAP Netweaver BI and Microsoft Analysis Services.

This document will cover the following items:

- Provide a list of “some” useful MDX functions
- How to use MDX in calculated measures for SAP Netweaver and Microsoft Analysis Services
- List the different types of pre-defined filter in OLAP universes
- Use @Select and @Prompt in OLAP universes metadata
- Provide recommendations, best practices and limitations if any.



2 MDX Functions

2.1 Remarks and comments

SAP Netweaver BI:

- Calculated measures must return numeric values
- Some limitations especially with time series functions
- MDX version supported is closed to MSAS 2000
- Tested on SAP BW 3.0, SAP BW 3.5 and SAP Netweaver BI 7.

2.2 Samples and definition: SAP and Microsoft

| Function | SAP Netweaver | MSAS 2005 and 2008 |
|------------------------|---|--|
| Aggregate | Aggregate({ [Z_ORDERD].[20040110]:[Z_ORDERD].[20040124] }, [Measures].[Z_ORDER]) | Aggregate({[Date].[Calendar].[Month].&[2002]&[2]:[Date].[Calendar].[Month].&[2003]&[10] }, [Measures].[Internet Sales Amount]) |
| Rank on measure | Rank([0CALMONTH].CurrentMember, Order([0CALMONTH].CurrentMember.Level.Members [Measures].[0D_INV_QTY], BDESC)) | Rank([Date].[Calendar].CurrentMember, Order([Date].[Calendar].CurrentMember.Level.Members , [Measures].[Internet Sales Amount], BDESC)) |
| Rank members | Rank([0CALMONTH].CurrentMember, [0CALMONTH].CurrentMember.Level.Members) | Rank([Date].[Calendar].CurrentMember, [Date].[Calendar].CurrentMember.Level.Members) |
| Variance | ([Measures].[0D_INV_QTY] - ([Measures].[0D_INV_QTY], [0CALMONTH].PrevMember)) / ([Measures].[0D_INV_QTY], [0CALMONTH].PrevMember) | ([Measures].[Internet Sales Amount] - ([Measures].[Internet Sales Amount], [Date].[Calendar].PrevMember)) / ([Measures].[Internet Sales Amount], [Date].[Calendar].PrevMember) |
| Weight | [Measures].[0D_INV_QTY] / ([Measures].[0D_INV_QTY], [0CALMONTH].Parent) | [Measures].[Internet Sales Amount] / ([Measures].[Internet Sales Amount], [Date].[Calendar].Parent) |
| Year To Date | SUM(YTD([0CALMONTH].CurrentMember), [Measures].[0D_INV_QTY]) It is important to notice that YTD (as well as QTD, MTD, WTD, etc) requires a reference to a predefined characteristic such as 0CALYEAR, 0CALQUARTER, 0CALMONTH, 0CALDAY or 0CALWEEK. Moreover, the selected characteristic must also be included in the query results. | SUM(YTD([Date].[Calendar].CurrentMember), [Measures].[Internet Sales Amount]) It is important to notice that YTD (as well as QTD, MTD, WTD, etc) requires a reference to a dimension tagged as Time. Moreover, the selected time dimension must also be included in the query results |
| Previous Member | ([Measures].[0D_INV_QTY], [0CALMONTH].PrevMember) | ([Measures].[Internet Sales Amount], [Date].[Calendar].PrevMember) |



| | | |
|---|---|---|
| Members range for a given parent | IIf([OCALMONTH].CurrentMember.Name >= [OCALMONTH].CurrentMember.FirstSibling.Lead(2)).Name and [OCALMONTH].CurrentMember.Name <= [OCALMONTH].CurrentMember.FirstSibling.Lead(5).Name,0,1) | IIf([Date].[Calendar].CurrentMember.Name >= [Date].[Calendar].CurrentMember.FirstSibling.Lead(2)).Name and [Date].[Calendar].CurrentMember.Name <= [Date].[Calendar].CurrentMember.FirstSibling.Lead(5).Name,0,1) |
| Filtered measure / Restricted key figure: Single member | (([Measures].[OD_INV_QTY], [OCALQUARTER].[19981], [OD_DIV].[7]) | (([Measures].[Internet Sales Amount], [Date].[Calendar].[Calendar Quarter].&[2003]&[1], [Product].[Product Categories].[Category].&[4]) |
| Filtered measure / Restricted key figure: Include range of members | Aggregate([OCALQUARTER].[19981]: [OCALQUARTER].[19983], [Measures].[OD_INV_QTY]) | Aggregate([Date].[Calendar].[Calendar Quarter].&[2003]&[1]: [Date].[Calendar].[Calendar Quarter].&[2003]&[3], [Measures].[Internet Sales Amount]) |
| Filtered measure / Restricted key figure: Exclude range of members | Aggregate(Except([OCALQUARTER].Members, [OCALQUARTER].[19981]: [OCALQUARTER].[19983]), [Measures].[OD_INV_QTY]) | Aggregate(Except([Date].[Calendar].[Calendar Quarter].Members, [Date].[Calendar].[Calendar Quarter].&[2003]&[1]: [Date].[Calendar].[Calendar Quarter].&[2003]&[3]), [Measures].[Internet Sales Amount]) |
| Standard deviation | Stdev({[OCALQUARTER].[19983], [OCALQUARTER].[19982], [OCALQUARTER].[19981]}, [Measures].[OD_INV_QTY]) | Stdev({[Date].[Calendar].[Month].[January 2003], [Date].[Calendar].[Month].[February 2003], [Date].[Calendar].[Month].[March 2003]}, [Measures].[Internet Order Quantity]) |
| Count members of a Dimension / Hierarchy / Level | Count([OCALYEAR].Members) Count([OCALYEAR].[LEVEL01].Members) | Count([Date].[Calendar].Members) Count([Date].[Calendar].[Quarter].Members) |
| Default Member | [OCALYEAR].DefaultMember | [Date].[Calendar].DefaultMember.Name |
| User name: User connected on the OLAP server | | username |

2.3 SAP and Microsoft validation tests

| Function | SAP Netweaver | MSAS 2005 and 2008 |
|-----------------|---------------|--------------------|
| Aggregate | OK | OK |
| Rank on measure | OK | OK |
| Rank members | OK | OK |



| | | |
|--|---|----|
| Variance | OK | OK |
| Weight | OK | OK |
| Year to Date | OK / Error: works only if Time dimension defined | OK |
| Previous Member | OK | OK |
| Members range for a given parent | OK | OK |
| Filtered measure | OK | OK |
| Standard deviation | OK | OK |
| Count members of a Dimension / Hierarchy / Level | OK | OK |
| Default Member | KO: only numeric values are allowed as result for calculated measures | OK |
| User name | Unsupported | OK |

For more information about MDX functions please have a look on the following link:
<http://msdn2.microsoft.com/en-us/library/ms145970.aspx>



3 Calculated measures

3.1 Definition

To define a Calculated Measure, users must create manually new Measures in the Universe. Calculated Measures definitions are using MDX functions embedded in XML tags.

In order to create calculated measures, users must to create pure MDX expression embedded in XML tags: `<EXPRESSION></EXPRESSION>`

In this new expression, we authorize to use any Designer function such as:

- `@Select`
- `@Prompt`
- `@Variable`

The check integrity will validate the XML syntax and any of the Designer functions described above.

No MDX parser is provided in this version of Universe Designer

This paragraph describes how to define calculated measures in MDX and using `@Select` and `@Prompt` functions

3.2 Recommendations

We recommend using `@Select` as much as possible rather than the Measure definition for multiple reasons:

- `@SELECT` is always resolved at query time
- Life Cycle Management only ensure integrity with generated objects not with objects created by a user: `@Select` always guarantee the validity of the object
- Check Integrity will only validate:
 - XML tags
 - Designer `@Function`
 - Objects that reference Levels, Level Attributes or Measures only

3.3 Use calculated measures in pre-defined filters

A calculated measure can be used in a pre-defined filter.

The expression can be embedded in the filter definition ore referenced by using an `@Select` function.

In such a case the filter definition must be as following:



- `<FILTER EXPRESSION="@Select(Class\Object)">`
- `<FILTER EXPRESSION="IIF([Measures].[Quantity] = 2000, 1, 0)">`

Moreover you have to encode special characters in the calculated expression in order to have the XML to be parsed correctly: this is due to a bug that will be fixed after Mira.

Example:

| Calculated measure definition that can be used in a result set | Calculated measure definition that can be used in a filter |
|--|--|
| <code><EXPRESSION>IIF(CDate([Time].CurrentMember.MemberValue > CDate("2006/01/01"), 1, 0)</EXPRESSION></code> | <code><FILTER EXPRESSION="IIF(CDate([Time].CurrentMember.MemberValue > CDate(&quot;2006/01/01&quot;), 1, 0)"><CONDITION OPERATORCONDITION="Equal"><CONSTANT CAPTION="1"/></CONDITION></FILTER></code> |

Here is a list of characters that must be encoded to be used in filters:

| Character | Encoding |
|-----------|----------|
| & | & |
| < | < |
| > | > |
| " | " |
| ' | ' |

3.4 Samples

| Calculated measure samples | Universe definition | Comments |
|----------------------------|---|--|
| Aggregate | <code><EXPRESSION>Aggregate({ [Z_ORDERD].[20040110]:[Z_ORDERD].[20040124] }, @Select(Key Figures\Order Amount))</EXPRESSION></code> | Invoke "Order Amount" measure definition |
| Rolling aggregate | <code><EXPRESSION>Aggregate({ [Date].[Calendar].CurrentMember:[Date].[Calendar].CurrentMember.lead(@Prompt('Number of periods','N',,mono,free))}, @Select(Measures\Reseller Sales Amount))</EXPRESSION></code> | Invoke "Reseller Sales Amount" measure definition. Prompt user to select the number of periods starting from the current member for the aggregate function: if the value is positive then the aggregation will take into account next members on the current hierarchy level. |
| Top/Bottom on measure | <code><EXPRESSION>Rank([0CALMONTH].CurrentMember, Order([0CALMONTH].CurrentMember.Level.Members @Select(Key Figures\Billed Quantity), B@Prompt('Top or Bottom','N',{ 'DESC', 'ASC'},mono,constrained,,{ 'DESC'})))</EXPRESSION></code> | Invoke "Billed quantity" measure definition. Prompt user to select Top or Bottom parameter: BDESC is for Top and BASC is for bottom. |
| Variance | <code><EXPRESSION>(@Select(Key Figures\Billed Quantity) - (@Select(Key Figures\Billed</code> | Invoke "Billed quantity" measure definition. |



| | | |
|--------------------------------------|---|---|
| | <code>Quantity), [0CALMONTH].PrevMember)) / (@Select(Key Figures\Billed Quantity), [0CALMONTH].PrevMember)</EXPRESSION></code> | |
| Weight | <code><EXPRESSION>@Select(Key Figures\Billed Quantity) / (@Select(Key Figures\Billed Quantity), [0CALMONTH].Parent)</EXPRESSION></code> | Invoke "Billed quantity" measure definition. |
| Year To Date | <code><EXPRESSION>SUM(YTD(@Select(Key Figures\Billed Quantity))</EXPRESSION></code> | Invoke "Billed quantity" measure definition. |
| Period To Date | <code><EXPRESSION>SUM(@Prompt('Period to date?', 'N', {'YTD', 'QTD', 'MTD', 'WTD'}, mono, constrained)(@Select(Key Figures\Billed Quantity)))</EXPRESSION></code> | Invoke "Billed quantity" measure definition. Prompt user to select which "period to date" to choose: YTD, QTD, MTD, WTD |
| Measure on previous Member | <code><EXPRESSION>(@Select(Key Figures\Billed Quantity), [0CALMONTH].PrevMember)</EXPRESSION></code> | Invoke "Billed quantity" measure definition. |
| Filtered measure | <code><EXPRESSION>((@Select(Key Figures\Billed Quantity), [0CALQUARTER].[19981], [0D_DIV].[7])</EXPRESSION></code> | Invoke "Billed quantity" measure definition. |
| Filtered measure with dynamic member | <code><EXPRESSION>((@Select(Key Figures\Billed Quantity), @Prompt('Division?', 'N', 'Division\L01 Division', mono, constrained))</EXPRESSION></code> | Invoke "Billed quantity" measure definition. Prompt user to select a member from the Division/Level 01 dimension |
| Standard deviation | <code><EXPRESSION>Stddev({[0CALQUARTER].[19983] , [0CALQUARTER].[19982], [0CALQUARTER].[19981]} , @Select(Key Figures\Billed Quantity)</EXPRESSION></code> | Invoke "Billed quantity" measure definition. |
| Measure increase | <code><EXPRESSION>@Select(Measures\Reseller Sales Amount) + (@Select(Measures\Reseller Sales Amount) * @Prompt('Enter increase percentage', 'N', , mono, free) /100)<EXPRESSION></code> | Invoke "Reseller Sales Amount" measure definition. Prompt user to enter a percentage value to increase Reseller Sales Amount. |
| Date comparison | <code><EXPRESSION>IIF(CDate([Time].[Default].Cu rrentMember.MemberValue) >= CDate('@Prompt('Enter date', 'D', , mono, free)') - @Prompt('Number of days before prompted date?', 'N', , mono, free) AND CDate([Time].[Default].CurrentMember.Memb erValue) <= CDate('@Prompt('Enter date', 'D', , mono, free)'), 1, 0)<EXPRESSION></code> | Compare Time.date with dates prompted. Prompt user to enter a date and a number of days to define the boundaries. This calculated measure works only with Microsoft because "CDate" is not supported by SAP BW. |



4 Universe pre-defined filters

4.1 Filter operators

Here is the list of supported operators in OLAP universes:

| Operator | Universe operator syntax |
|------------------------|--------------------------|
| Equal | Equal |
| Not equal | NotEqual |
| Greater | Greater |
| Greater than or equal | GreaterOrEqual |
| Less | Less |
| Less than or equal | LessOrEqual |
| Between | Between |
| Not between | NotBetween |
| In list | InList |
| Not in list | NotInList |
| Matches pattern | Like |
| Different from pattern | NotLike |

4.2 Samples

| FILTER TYPE | SAP Netweaver | MSAS 2005 and 2008 |
|---|---|--|
| Mandatory filter with prompt | <pre><FILTER KEY= "[0D_DIV].[LEVEL01]"><CONDITION OPERATORCONDITION="Equal"><CONSTANT CAPTION="@Prompt('L01 Division','A','Division\L01 Division',mono,constrained)"/></C ONDITION></FILTER></pre> | <pre><FILTER KEY= "[Date].[Calendar].[Calendar Year]"><CONDITION OPERATORCONDITION="InList"><CONSTANT CAPTION="@Prompt('Calendar Year(s)','A','Date.Calendar\Calen dar Year',multi,constrained)"/></COND ITION></FILTER></pre> |
| Mandatory filter with prompt referencing a universe dimension | <pre><FILTER KEY="@Select(Division\L01 Division)"><CONDITION OPERATORCONDITION="Equal"><CONSTANT CAPTION="@Prompt('L01 Division','A','Division\L01 Division',mono,constrained)"/></C ONDITION></FILTER></pre> | <pre><FILTER KEY= "@Select(Date.Calendar\Calend ar)"><CONDITION OPERATORCONDITION="InList"><CONSTANT CAPTION="@Prompt('Calendar Year(s)','A','Date.Calendar\Calen dar Year',multi,constrained)"/></COND ITION></FILTER></pre> |
| Optional filter with prompt | <pre><OPTIONAL><FILTER KEY= "[0D_DIV].[LEVEL01]"><CONDITION OPERATORCONDITION="Equal"><CONSTANT CAPTION="@Prompt('L01 Division','A','Division\L01 Division',mono,constrained)"/></C</pre> | <pre><OPTIONAL><FILTER KEY= "[Date].[Calendar].[Calendar Year]"><CONDITION OPERATORCONDITION="InList"><CONSTANT CAPTION="@Prompt('Calendar Year(s)','A','Date.Calendar\Calen dar</pre> |



| | | |
|--|---|---|
| | <pre> CONDITION></FILTER></OPTIONAL> </pre> | <pre> Year',multi,constrained)"/></COND ITION></FILTER></OPTIONAL> </pre> |
| Optional filter with prompt referencing a universe dimension | <pre> <OPTIONAL><FILTER KEY="@Select(Division\L01 Division)"><CONDITION OPERATORCONDITION="Equal"><CONSTA NT CAPTION="@Prompt('L01 Division','A','Division\L01 Division',mono,constrained)"/></C ONDITION></FILTER> </pre> | <pre> <FILTER KEY="@Select(Date.Calendar\Calend ar)"><CONDITION OPERATORCONDITION="InList"><CONST ANT CAPTION="@Prompt('Calendar Year(s)','A','Date.Calendar\Calen dar Year',multi,constrained)"/></COND ITION></FILTER></OPTIONAL> </pre> |
| Filter with default value (with Index Awareness) | <pre> <FILTER KEY="[0D_DIS_CHAN].[LEVEL01].[TEC H_NAME]"><CONDITION OPERATORCONDITION="InList"><CONST ANT CAPTION="@Prompt('L01 Distribution Channel','A','Distribution Channel\L01 Distribution Channel',multi,primary_key,,{'Direct Sales':'[0D_DIS_CHAN].[1]')"/></C ONDITION></FILTER> </pre> | <pre> <FILTER KEY="[Date].[Calendar].[Calendar Quarter].[TECH_NAME]"><CONDITION OPERATORCONDITION="InList"><CONST ANT CAPTION="@Prompt('Calendar Quarter','A','Date.Calendar\Calen dar Quarter',multi,primary_key,,{'Q2 CY 2002':'&[2002]&[2]')"/></CONDITIO N></FILTER> </pre> |
| Filter with default value (without Index Awareness) | <pre> <FILTER KEY="[0D_DIS_CHAN].[LEVEL01] "><CONDITION OPERATORCONDITION="InList"><CONST ANT CAPTION="@Prompt('L01 Distribution Channel','A','Distribution Channel\L01 Distribution Channel',multi,primary_key,,{'Direct Sales'})"/></CONDITION></FILTER> </pre> | <pre> <FILTER KEY="[Date].[Calendar].[Calendar Quarter]"><CONDITION OPERATORCONDITION="InList"><CONST ANT CAPTION="@Prompt('Calendar Quarter','A','Date.Calendar\Calen dar Quarter',multi,primary_key,,{'Q2 CY 2002'})"/></CONDITION></FILTER> </pre> |
| Filter with constants (with Index Awareness) | <pre> <FILTER KEY="[0D_DIS_CHAN].[LEVEL01].[TEC H_NAME]"><CONDITION OPERATORCONDITION="InList"><CONST ANT CAPTION="[0D_DIS_CHAN].[1]"/><CON STANT CAPTION="[0D_DIS_CHAN].[12]"/></C ONDITION></FILTER> </pre> | <pre> <FILTER KEY="[Date].[Calendar].[Calendar Quarter].[TECH_NAME]"><CONDITION OPERATORCONDITION="InList" ><CONSTANT CAPTION="[Date].[Calendar].[Calen dar Quarter].&[2002]&[2]"/><CONSTANT CAPTION="[Date].[Calendar].[Calen dar Quarter].&[2001]&[4]"/></CONDITIO N></FILTER> </pre> |
| Filter with constants (without Index Awareness) | <pre> <FILTER KEY="[0D_DIS_CHAN].[LEVEL01]"><CO NDITION OPERATORCONDITION="InList"><CONST ANT CAPTION="Direct Sales" /><CONSTANT CAPTION="Final Customer Sales"/></CONDITION></FILTER> </pre> | <pre> <FILTER KEY="[Date].[Calendar].[Calendar Quarter]"><CONDITION OPERATORCONDITION="InList" ><CONSTANT CAPTION="Q2 CY 2002"/><CONSTANT CAPTION="Q4 CY 2001"/></CONDITION></FILTER> </pre> |
| Dynamic operator | <pre> <FILTER KEY="[0D_DIS_CHAN].[LEVEL01]"><CO NDITION OPERATORCONDITION="@prompt('Distr ibution Channel operator','N',{'Greater','Less',' </pre> | <pre> <FILTER KEY="[Product].[Product Categories].[Category]"><CONDITIO N OPERATORCONDITION="@prompt('Produ ct Category operator','N',{'Greater','Less',' </pre> |



| | | |
|--|---|--|
| | <pre>Equal','Like'},mono,free,,{'Like'})"><CONSTANT CAPTION="@Prompt('L01 Distribution Channel','A','Distribution Channel\L01 Distribution Channel',mono,free)"/></CONDITION ></FILTER></pre> | <pre>Equal','Like'},mono,free,,{'Like'})"><CONSTANT CAPTION="@Prompt('Product Category','A','Product Categories\Category',mono,free)"/ ></CONDITION></FILTER></pre> |
| <p>Combined filter with OR operator (useful with optional prompts and free fill)</p> | <pre><OPERATOR VALUE="OR"><OPTIONAL><FILTER KEY="[0CALYEAR].[LEVEL01]"><CONDI TION OPERATORCONDITION="InList"><CONST ANT CAPTION="@prompt('Enter value(s) for L01 Calendar year:', 'A', 'Calendar year\L01 Calendar year',Multi,Free)" /></CONDITION></FILTER></OPTIONAL ><OPTIONAL><FILTER KEY="[0CALQUARTER].[LEVEL01]"><CO NDITION OPERATORCONDITION="InList"><CONST ANT CAPTION="@prompt('Enter value(s) for L01 Cal. Year/Quarter:', 'A', 'Cal. Year/Quarter\L01 Cal. Year/Quarter',Multi,Free)" /></CONDITION></FILTER></OPTIONAL ><OPTIONAL><FILTER KEY="[0CALMONTH].[LEVEL01]"><CONDI TION OPERATORCONDITION="InList"><CONST ANT CAPTION="@prompt('Enter value(s) for L01 Cal. Year/Month:', 'A', 'Cal. Year/Month\L01 Cal. Year/Month',Multi,Free)" /></CONDITION></FILTER></OPTIONAL ></OPERATOR></pre> | <pre><OPERATOR VALUE="OR"><OPTIONAL><FILTER KEY="[Date].[Calendar].[Calendar Year]"><CONDITION OPERATORCONDITION="InList"><CONST ANT CAPTION="@prompt('Enter value(s) for Calendar Year:', 'A', 'Date.Calendar\Cale ndar Year',Multi,Free)" /></CONDITION></FILTER></OPTIONAL ><OPTIONAL><FILTER KEY="[Date].[Calendar].[Calendar Quarter]"><CONDITION OPERATORCONDITION="InList"><CONST ANT CAPTION="@prompt('Enter value(s) for Calendar Quarter:', 'A', 'Date.Calendar\Cale ndar Quarter',Multi,Free)" /></CONDITION></FILTER></OPTIONAL ><OPTIONAL><FILTER KEY="[Date].[Calendar].[Month]">< CONDITION OPERATORCONDITION="InList"><CONST ANT CAPTION="@prompt('Enter value(s) for Month:', 'A', 'Date.Calendar\Month', Multi,Free)" /></CONDITION></FILTER></OPTIONAL ></OPERATOR></pre> |
| <p>Combined filter with AND operator</p> | <pre><OPERATOR VALUE="AND"><OPTIONAL><FILTER KEY="[0CALYEAR].[LEVEL01]"><CONDI TION OPERATORCONDITION="InList"><CONST ANT CAPTION="@prompt('Enter value(s) for L01 Calendar year:', 'A', 'Calendar year\L01 Calendar year',Multi,Free)" /></CONDITION></FILTER></OPTIONAL ><OPTIONAL><FILTER KEY="[0CALQUARTER].[LEVEL01]"><CO NDITION OPERATORCONDITION="InList"><CONST ANT CAPTION="@prompt('Enter value(s) for L01 Cal. Year/Quarter:', 'A', 'Cal. Year/Quarter\L01 Cal. Year/Quarter',Multi,Free)" /></CONDITION></FILTER></OPTIONAL ></OPERATOR></pre> | <pre><OPERATOR VALUE="AND"><OPTIONAL><FILTER KEY="[Date].[Calendar].[Calendar Year]"><CONDITION OPERATORCONDITION="InList"><CONST ANT CAPTION="@prompt('Enter value(s) for Calendar Year:', 'A', 'Date.Calendar\Cale ndar Year',Multi,Free)" /></CONDITION></FILTER></OPTIONAL ><OPTIONAL><FILTER KEY="[Date].[Calendar].[Calendar Quarter]"><CONDITION OPERATORCONDITION="InList"><CONST ANT CAPTION="@prompt('Enter value(s) for Calendar Quarter:', 'A', 'Date.Calendar\Cale ndar Quarter',Multi,Free)" /></CONDITION></FILTER></OPTIONAL ></OPERATOR></pre> |



| | | |
|---|---|--|
| Filter with a calculated member in the filter expression | <pre><FILTER EXPRESSION=" IIF([OCALYEAR].CurrentMember > "2000", 1, 0)"><CONDITION OPERATORCONDITION="Equal "><CONSTANT CAPTION="1" /></CONDITION></FILTER ></pre> | <pre><FILTER EXPRESSION=" IIF([Date].[Calendar].CurrentMember.Name > 'CY 2002', 1, 0)"><CONDITION OPERATORCONDITION="Equal "><CONSTANT CAPTION="1" /></CONDITION></FILTER ></pre> |
| Filter with a calculated member referenced in the filter expression | <pre><FILTER EXPRESSION="@Select(Calendar Year\My Calculated Member)"><CONDITION OPERATORCONDITION="Equal "><CONSTANT CAPTION="1" /></CONDITION></FILTER ></pre> | <pre><FILTER EXPRESSION="@Select(Date.Calendar\My Calculated Member)"><CONDITION OPERATORCONDITION="Equal "><CONSTANT CAPTION="1" /></CONDITION></FILTER ></pre> |

4.3 Other samples

Requirement:

I want to select a member in a hierarchy but I don't know to which level it belongs.

Solution:

Create a filter that contains all the hierarchy levels and select the following options

- Optional prompt
- No list of values
- Prompt operator: Matches pattern
- Global operator: OR

Sample with the hierarchy Accounts on AdventureWorks:

OLAP universe filter syntax:

<OPERATOR VALUE="OR" >



```
<OPTIONAL>
  <FILTER KEY="[Account].[Accounts].[Account Level 06]" >
    <CONDITION OPERATORCONDITION="Like" >
      <CONSTANT CAPTION="@prompt('Enter value(s) for
Account:','A',,Mono,Free,Persistent,,User:0,optional)" />
    </CONDITION>
  </FILTER>
</OPTIONAL>
<OPTIONAL>
  <FILTER KEY="[Account].[Accounts].[Account Level 05]" >
    <CONDITION OPERATORCONDITION="Like" >
      <CONSTANT CAPTION="@prompt('Enter value(s) for
Account:','A',,Mono,Free,Persistent,,User:0,optional)" />
    </CONDITION>
  </FILTER>
</OPTIONAL>
<OPTIONAL>
  <FILTER KEY="[Account].[Accounts].[Account Level 04]" >
    <CONDITION OPERATORCONDITION="Like" >
      <CONSTANT CAPTION="@prompt('Enter value(s) for
Account:','A',,Mono,Free,Persistent,,User:0,optional)" />
    </CONDITION>
  </FILTER>
</OPTIONAL>
<OPTIONAL>
  <FILTER KEY="[Account].[Accounts].[Account Level 03]" >
    <CONDITION OPERATORCONDITION="Like" >
      <CONSTANT CAPTION="@prompt('Enter value(s) for
Account:','A',,Mono,Free,Persistent,,User:0,optional)" />
    </CONDITION>
  </FILTER>
</OPTIONAL>
<OPTIONAL>
  <FILTER KEY="[Account].[Accounts].[Account Level 02]" >
    <CONDITION OPERATORCONDITION="Like" >
      <CONSTANT CAPTION="@prompt('Enter value(s) for
Account:','A',,Mono,Free,Persistent,,User:0,optional)" />
    </CONDITION>
  </FILTER>
</OPTIONAL>
<OPTIONAL>
  <FILTER KEY="[Account].[Accounts].[Account Level 01]" >
    <CONDITION OPERATORCONDITION="Like" >
      <CONSTANT CAPTION="@prompt('Enter value(s) for
Account:','A',,Mono,Free,Persistent,,User:0,optional)" />
    </CONDITION>
  </FILTER>
</OPTIONAL>
</OPERATOR>
```



5 When using universe @functions

5.1 Using @Select function

You can define any new object by entering its definition (MDX or Essbase) or by referencing an existing object by using @Select function.

We recommend using @Select as much as possible rather than the object definition for multiple reasons:

- Life Cycle Management only ensure integrity with generated objects not with objects created by a user: @Select always guarantee the validity of the object
- @Select allow to define a level or part of it and to be reuse anywhere in the universe

@Select can be used anytime in:

- Objects definition
- Details definition
- Measures definition
- Pre-defined filters definition
- Where clause of Objects / Details / Measures
- Calculated measures

5.2 Using @Prompt function

@Prompt is a way to define parameters in the universe that will let users to choose among a list of values/members one or multiple values.

Those parameters can be selected at query time by users to restrict the data to be retrieved: the answers to these parameters can be mandatory or optional.

@Prompt can also be defined with default values.

Last these parameters can also be automatically added to the query with no user intervention: they act like SAP variables (compulsory filters).

We recommend using widely @Prompt in universes because they provide a lot of flexibility when building reports, queries, analysis or dashboards.

Moreover it is strongly recommended to use as much as possible @Prompt with QaaWS in order to be consumed with XCelsius Enterprise

@Prompt is used in order to:

- Choose dynamically a measure
- Choose dynamically a hierarchy level
- Choose dynamically a dimension and a hierarchy level



- Enter a value for:
 - Computations
 - Select a relative position from a current member: Lead or Lag functions
 - Use to retrieve partially members based on a top/bottom selection: Rank function

5.3 Samples

The table underneath shows samples of prompt usage in order to have queries more dynamic.

| Sample | Universe definition |
|--|---|
| Choose a level from the Date Calendar dimension in an MSAS cube | <code>[Date].[Calendar Year].[@prompt('Calendar level','N',{'(All)','Calendar Year','Calendar Semester','Calendar Quarter','Month','Date'},mono,constrained)]</code> |
| Choose a dimension among the different "time" dimensions available in a SAP Netweaver cube | <code>[OCAL@Prompt('Calendar Level?','N',{ 'YEAR','QUARTER','MONTH','DAY'},mono,constrained)].[LEVEL01]</code> |
| Choose a measure among the different measures available in an MSAS cube | <code>[Measures].[@prompt('Measure','N',{ 'Reseller Sales Amount','Reseller Order Count','Sales Amount Quota'},mono,constrained)]</code> |
| Choose a measure among the different measures available in an SAP Netweaver cube | <code>[Measures].[0D_@prompt('Measure','N',{ 'COST','INV_QTY','NETVLINV','TAXAMOUN'},mono,constrained)]</code> |
| Select a range of members in the Date Calendar dimension starting from the current member in an aggregated measure | <code><EXPRESSION>Aggregate({ [Date].[Calendar].CurrentMember:[Date].[Calendar].CurrentMember.lead(@Prompt('Number of periods','N',,mono,free)) }, @Select(Measures\Reseller Sales Amount))</EXPRESSION></code> |