

# SAP Solutions for Performance Management



## SAP Business Planning and Consolidation

### 5.x Logic Explained

### Part 2 of 3

# SAP Solutions for Performance Management



**Logic Overview – Part 1**

**Script Formulas Overview – Part 2**

**Script Formulas Advanced – Part 3**

## SQL Based Script Formulas

- ❑ Syntax example
- ❑ Managing scope

## Script Formulas

- Use when calculation can be performed before the aggregations
- Data is generated at the base levels in all dimensions and the cube performs natural aggregations
  - ◆ Triggered via a data update or DTS package
- Currency conversion, Unit X Rates, Allocations etc.
- Syntax MDX or SQL based logic?

***Note: SQL Logic is NOT Microsoft but our proprietary language processed on the application tier***

- ◆ Answer is ALWAYS go with SQL logic
- ◆ MDX will perform poorly with concurrent users on the application
- ◆ SQL logic has the same capabilities with new functions like “Calc\_Dummy\_Org” for parent values and “Calc\_Each\_Period” for carry forward logic

**Calculate 3rdPartyRev as Sales Units \* Sales Price**

**The “When” question**

- **Before or after aggregations?**

**The “WHAT” and the “HOW”.**

- **Data creation**
- **Logic files get created in the Admin Console**
  - ◆ **Default Logic – Executed on Data Send**
  - ◆ **Package – Executed in Batch Mode**
- **Syntax**
  - ◆ **MDX – *AVOID***
  - ◆ **SQL**
  - ◆ **Table (parameter) driven – Stored Procedures (script program generated)**

## Script Formula Example

### Before or after aggregations?

	Entity1	Entity2	Entity3	Total
Sales Units	100,000	115,000	127,000	342,000
Sales Price	10	10	10	30
Sales	1,000,000	1,150,000	1,270,000	10,260,000
	Entity1	Entity2	Entity3	Total
Sales Units	100,000	115,000	127,000	342,000
Sales Price	10	10	10	30
Sales	1,000,000	1,150,000	1,270,000	3,420,000

After  
Aggregations

Before  
Aggregations

# Script Logic – MDX Consideration

## Advantages

- Straightforward (more intuitive)
- Standard in market (not proprietary)

## Disadvantage - Performance, Performance, Performance

- General inefficiency
- Concurrency
- Running on a lot of intersections (Batch Mode)

## BPC 5 schema impact

- Hierarchy specific = high maintenance
- SQL 2000 complex tuple syntax required
- SQL 2005 performance killer just to have the property

Bottom line – **DON'T USE IT** *unless you have no SQL alternative*

**Developed for performance and scalability**

**Completely separate syntax (proprietary)**

**Bases calculations on the existence of data (record) in FACT tables** *(always keep this in mind as you get more advanced in your calculations this can be critical in your design)*

**Calculations performed at the SQL level not the OLAP (Cube) level.**

**Major paradigm shift**



## SQL Based Logic – Behind the Scenes

**Logic module loads a selection of data into memory (scope of the query).**

**The user defined formulas are applied to the selected data and a result set of records is generated**

**The result set is written back to the database.**

### Understanding the selection region (Scope of the Query)

- **When invoked via Excel the Scope is**
  - ◆ **Account Dimension – All non-calculated accounts**
  - ◆ **All Other Dimensions – Only specific members sent via worksheet/workbook**
- **When invoked via a DMM Package**
  - ◆ **Selected Dimension – Only members selected for prompted dimensions (package and logic dependent)**
  - ◆ **Non-specified Dimension – All base members**
  - ◆ **Currency – LC if not specified**
- **Scope can also be controlled by written logic instructions in the script**

### The WHEN statement triggers SQL Logic

**\*WHEN {criteria}**

**\*IS {valid condition1}[,{valid condition2},...]**

**\*REC[([FACTOR|EXPRESSION={Expression}[,{dim1}={member},{dim2}=...]])]**

**[\*ELSE]**

**...**

**\*ENDWHEN**

**Lets break this down...**

## WHEN Examples

**\*WHEN \***

Operates on the entire selection

**\*IS \***

**\*WHEN ACCOUNT**

Operates only on the SalesUnits Account

**\*IS "SalesUnits"**

**\*WHEN Account.ACCTYPE**

Operates only on Accounts where the

**\*IS "INC", "EXP"**

ACCTYPE property is INC or EXP.

The \*REC statement generates a new record

**\*REC**[[**FACTOR**|**EXPRESSION**={Expression}[, {dim1}= {member}, {dim2}=...]]

**FACTOR** and **EXPRESSION** – Derive the new value by applying simple math.

- **FACTOR** is faster and simpler to use if just multiplying the value of current record by something (an exchange rate or a price or a percent ownership or just a straight value).
- **EXPRESSION** lets you write more complex formulas like **EXPRESSION=(%VALUE%+GET(ACCOUNT="SomeAccount"))/GET(ACCOUNT="SomeOtherAccount")** you cannot write this expression using a **FACTOR**
  - ◆ %VALUE% contains the value of current record.
  - ◆ The **GET** lets you retrieve the value of some other record.
  - ◆ Hint: the **GET** only looks for records you already have in memory, it does not go to the DB.

The last parameter(s) allow you to redirect the result to different dimension members.

To calculate a new Statistical Account Named “UpsideRev” that is the total of all revenue accounts marked up 25%..

**\*WHEN ACCOUNT.GROUP**

**\*IS “REV”**

**\*REC(FACTOR=1.25,ACCOUNT=“UpsideRev”)**

**\*ENDWHEN**

**\*COMMIT**

To calculate a new Statistical Account Named “UpsideRev” that is the total of all revenue accounts marked up 25%..

```
*WHEN ACCOUNT.GROUP
```

```
*IS “REV”
```

```
*REC(EXPRESSION=%VALUE%*1.25,ACCOUNT=“UpsideRev”)
```

```
*ENDWHEN
```

```
*COMMIT
```

**GET** allows you to apply another value from the selected region and use it in the **FACTOR** or **EXPRESSION**.

**GET({dimension}={member}[, {dimension}={member}]...)**

Instead of hard coding a percentage, to pull the percentage from another Account named “UpsidePCT”

**\*WHEN ACCOUNT.GROUP**

**\*IS “REV”**

**\*REC(FACTOR=GET(ACCOUNT=“UpsidePCT”),ACCOUNT=“UpsideRev”)**

**\*ENDWHEN**

**\*COMMIT**



## More Logic Control

**There are more methods of controlling your complex logic execution:**

- **Expanded scope**
- **Selecting a range**

**Reminder:** SQL logic only applies to the region of records in memory (not in the DB)

There are often issues where a value required in the calculation is outside the scope of your selection.

There are a few of ways to handle this

- Expand the member region
- Override the member region
- Use the LOOKUP\ENDLOOKUP structure

## Expand Member Selection

**It is possible to expand the selection range passed into the Logic Module runtime memory.**

```
*XDIM_MEMBERSET {Dimension name} = {Members Set}
```

**We want our Unit \* Price Calculation to run on the “Non\_Interco” member of the INTCO Dimension.**

```
*XDIM_MEMBERSET IntCo = Non_Intco
```

**It is possible to merge members to the set of members passed into the region.**

```
*XDIM_ADDMEMBERSET {dimension} = {members set}
```

## SQL Based Logic Syntax - Memberset

Assume you need only this calculation:  $\text{Account A} = \text{Account B} + \text{Account C}$

The logic to achieve this will look as follows:

```
*WHEN ACCOUNT
```

```
*IS B,C                (if you find values for these accounts...
```

```
*REC(ACCOUNT=A)      ... add them into account A)
```

```
*ENDWHEN
```

This logic would, by default, load in memory all possible accounts. However, if this is the only calculation, there is no need to load in memory all accounts, and the logic will run faster if it's written this way:

```
*XDIM_MEMBERSET ACCOUNT=B, C
```

```
*WHEN *
```

```
*IS *
```

```
*REC(ACCOUNT=A)
```

```
*ENDWHEN
```

The instruction `* XDIM_MEMBERSET` supports also the “not equal to” operator with the syntax:

```
* XDIM_MEMBERSET {Dimension}<>{MemberSet}
```

**To avoid MDX to get a parent value, you can generate parent totals in memory**

*// make sure you have all entities in memory*

*\*XDIM\_MEMBERSET ENTITY=<ALL>*

*// generate all parent values based on the hierarchy number*

*\*CALC\_DUMMY\_ORG ENTITY=PARENTH1*

*// use them as appropriate (note the # sign for valid Parent IDs)*

*\*WHEN ENTITY*

*\*IS #SALESEUROPE*

*\*REC(FACTOR=1/GET(ENTITY=#WORLDWIDE1),  
ACCOUNT="SomeRatio")*

*\*ENDWHEN*

**To avoid MDX to get previous balances, you can generate the carry-forward balance**

**Combination of the following is required:**

- **Keyword “Prior”**
- **SQL syntax for Calc\_Each\_Period**
- **SQL syntax for Calc\_Dummy\_Org**
- **Memory variables**

# SQL Based Logic Syntax – Calc\_Each\_Period

```
*CALC_EACH_PERIOD
*XDIM_MEMBERSET TIME=PRIOR,%TIME_SET%,%YEAR%.DEC
*CALC_DUMMY_ORG ACCOUNT=PARENTH1
*WHEN TIME
*IS PRIOR
    *WHEN ACCOUNT
    *IS CYNI
        *REC(ACCOUNT=#OPE_CYNI,TIME=NEXT)
    *ENDWHEN
*ELSE
    *WHEN ACCOUNT
    *IS #NETINCOME
        *REC(ACCOUNT=#OPE_CYNI,TIME=NEXT)
        *REC(ACCOUNT=CYNI)
    *IS #OPE_CYNI
        *WHEN TIME.PERIOD
        *IS<>JAN
            *REC(ACCOUNT=#OPE_CYNI,TIME=NEXT)
            *REC(ACCOUNT=CYNI)
        *ENDWHEN
    *ENDWHEN
*ENDWHEN
```

## Selecting a Range

**We want our Unit \* Price Calculation to run on the members of the INTCO Dimension where the GROUP Property has a value of “NoInp” .**

**\*SELECT(%IC\_MBRs%, “ID”, “INTCO”, “[GROUP] = ‘NoInp’”)**

**\*XDIM\_MEMBERSET IntCo = %IC\_MBRs%**

**\*SELECT is run against the SQL tables**

**Or using MDX against the cube**

**\*MEMBERSET({variable}, {member set in MDX format})**

**\*MEMBERSET (%IC\_MBRs%, “filter{[INTCO].members, [INTCO].properties(“GROUP”) = “NoInp”}”)**

**\*SELECT and \*MEMBERSET statements are executed at the time the logic is validated, and the expanded result is written in the LGX file. This means that if the related dimension is modified, it may be necessary to re-validate the logic.**

- **Workaround is to call an LGF file instead of an LGX file in the DM package. The file is validated at run-time which captures any recent changes to the dimensions.**
- **Can also call an LGF for default logic using an include myDefault.lgf**



## Selecting a Range

**We want our Unit \* Price Calculation to run on the base members of the DataSrc Dimension under the “PreAdj” Parent..**

```
*MEMBERSET(%DS_MBR%, "Descendants([DataSrc].[PreAdj], 999, LEAVES)")
```

```
*XDIM_MEMBERSET DATASRC = %DS_MBR%
```

*\*MEMBERSET uses MDX and is run against the Cube.*

*The MDX query is very light (no access to values only to dimension information), so we still use it.*

**In allocations there is newer syntax not requiring MDX by which you can say DATASRC=BAS(PREADJ)**

**\*XDIM\_MEMBERSET, as follows:**

```
*XDIM_MEMBERSET DATASRC=BAS(PREADJ) However it's not supported yet.
```

**If you have only one level you can also use this instruction, which is fully SQL:**

```
*SELECT(%DS_MBR%, ID, DATASRC, PARENTH1='PREADJ')
```

```
*XDIM_MEMBERSET DATASRC=%DS_MBR%
```

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