Business Planning and Consolidation
5.x Logic Explained
Part 1 of 3
SAP Solutions for Performance Management

Logic Overview – Part 1

Script Formulas Overview – Part 2

Script Formulas Advanced – Part 3
Agenda

Logic overview

- What
- Where
- When
- How

Logic Advice

Dimension Logic
What is “logic” in SAP BPC

General understanding of what “logic” is for BPC

- At the most basic level logic is just a calculation
- The questions are where, when and how the logic is executed that requires the expertise

Where – calculations can be generated by:
- Analysis Services
- BPC Application Server
- Excel

When - calculations can be executed:
- As data is queried from the application
- As data is written to the application
- After data is written to the application

How – calculations are defined
- Within the definition of a dimension using Microsoft MDX language
- A script using a proprietary language
- Using a rules based engine for specific pre-defined business requirements
- Excel formulas
Where logic is executed

Analysis Services
- Microsoft provides capability of defining calculations within a dimension
- Calculations performed as user queries the data
- Results stored in the cache only
- First query will allow take longer than subsequent queries

BPC Application Server
- BPC proprietary logic engine reads script or rules based definition
- Application Server tier retrieves data and calculates results
- Results stored in database directly

Excel/Live Reporting
- Excel based formulas calculate on data retrieved within workbook
- Results stored only in workbook
- Live Reporting on the web supports simple calculations
When logic is executed

As data is queried from the application
- Analysis Services member calculations, on the fly
- Excel calculations, on the fly or on demand (F9)
- Live Reporting calculations, on the fly

As data is written to the application
- Calculation on the fly when user send data from Data Loads, Excel, Live Reporting, Word, PowerPoint or Journal Entries
- Mechanism = default logic script

After data is written to the application
- Calculates on demand via Data Manager packages
- Script or rules based logic supported only
How logic is defined

Dimension Logic (use sparingly!)
- Within the definition of a dimension using Microsoft MDX language
- Calculations defined for a specific member ID
- Calculations can be defined for specific intersections within one application only (cube)

Script Logic
- A script using a proprietary language or MDX
- Calculations defined for a specific member ID
- Creates base level data in the application
- Calculations can cross applications

Rules Based (table driven) Logic
- Using a rules based engine for specific pre-defined business requirements
  - Legal consolidation
  - Currency
  - Elimination
- Rules not specific to a single member ID
- Calculations will cross applications

Sheet Based Logic (not covered in these presentation)
- Exists in worksheet only
Logic Advice

In general you want to create data for logic to avoid performance issues in production.

Apply best practices to help determine which type of logic to use:
- Do not assume just because it is possible in development that it will be successful in production.

Application specifics can help determine approach – use holistic approach:
- Application Size (dimensions, data)
- # of Users
- Application functionality (read, write)

MDX logic structure has changed in BPC 5.
Script Logic Pitfalls

BPC logic is a powerful tool – but can be a performance issue if not written correctly

- Logic syntax is not easy to grasp – plus limited training availability
- The logic design is not very intuitive to a business user
- Multiple ways to do the same thing with only 1 or 2 that perform as desired – hard to know best practice

The good news is we are working on:

- Improving knowledge dissemination
- Usability in the product
- Thinking on next generation logic has begun
Logic Approach – Dimension Formulas

Necessary when calculating after the aggregation (parent calculations)
- Ratios, KPI’s etc.

Use of SOLVEORDER
- Control calculation order across dimensions – does not apply if all formulas are in one dimension
- Control relationship to the Measures Dimension (a separate dimension)

Dimension Logic will have a negative impact on retrieval times when system is in use by multiple users!
- Don’t get fooled by the development environment performance

For BPC 5 see formula guidance
- Requires tuples with IIF statements on ALL logic statements
- SQL 2005 currently has serious performance issues when formula property exists in dimension! Microsoft says they are working on it.
BPC 5 implements multiple hierarchies as separate dimensions in Analysis Services (AS).

- For example if the account dimension has two hierarchies AS will create two dimensions named account.h1 and account.h2.
- The top member of these dimensions will be named [all account.h1] and [all account.h2.] All members of the dimension roll up to this top level member.
- An understanding of this concept is important because it relates to how MDX formulas need to be written.
Suppose we want to define a formula as following in a dimension with 3 hierarchies:

#CF_ST_FIN_RATE= ((#IFRSTRATE/#WKSYR)*#WKSCURMTH)

Where IFRSTRATE, WKSYR and WKSCURMTH are base members of hierarchy H1 of Account dimension, and CF_ST_FIN_RATE is a dimension formula in H1 of account dimension.

- The correct formula for H1 is
  

- An example of this formula for H2:
  

Note:
- All variables need to be fully qualified with dimension name and hierarchy name, such as account.h1.IFRSTRATE. Otherwise AS returns a syntax error.
Note:

- When defining a formula on H1, you have to specify that formula returns a valid result only if the current members on other hierarchies are at the top level of each hierarchy.

- Previous example is for the case that base member has dimension formula. If you need to define dimension formula for parent member, you have to use a different type of formula because you need to roll up the value of children. So in previous case, if CF_ST_FIN_RATE is parent member, you have to define the following. The correct formula for H1 is

\[
\]

An example of this formula for H2:

\[
\]

Please see the “V5x DimensionFormula Guide.doc” for full details
Dimension Formula Example

Calculate Net Income per Head as NetIncome/Headcount
- Does the calculation have to be run at aggregated levels?
- What is the relationship with the Measures Dimension?
- ACCTYPE considerations?
- What is the relationship to the Time Dimension?
Does the calculation have to be run at aggregated levels?

- Yes. In fact, it MUST be run at aggregated levels in order to generate the correct result.

### After Aggregations

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<th>Entity2</th>
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<th>Entity Total</th>
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</table>
Dimension Formula Example

What is the relationship with the Measures Dimension?

- This calculation should be run after the Measures calculation. Use a SOLVE.ORDER = 4 or higher.

Any ACCTYPE Considerations

- NetIncome – INC
- HEADCOUNT - AST
- Since the calculation happens after the Measures calculation the ACCTYPE will not come into play.
**Dimension Formula Example**

What is the relationship with the Time Dimension

- In this situation an average may be required when looking at Headcount at a parent in the Time Dimension.

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