



## Best Practice in Essbase Business Rule Writing

Evgeniy Galanzovsky  
PROMATIS software GmbH  
*Nürnberg, 17.11.2015*

# Agenda

- Introduction into problems
- Example
- FIX statement
- Calculations
- Create block approaches
- Aggregation

# Relational DB vs. OLAP (calculations)

Task: Calculate profit for current scenario

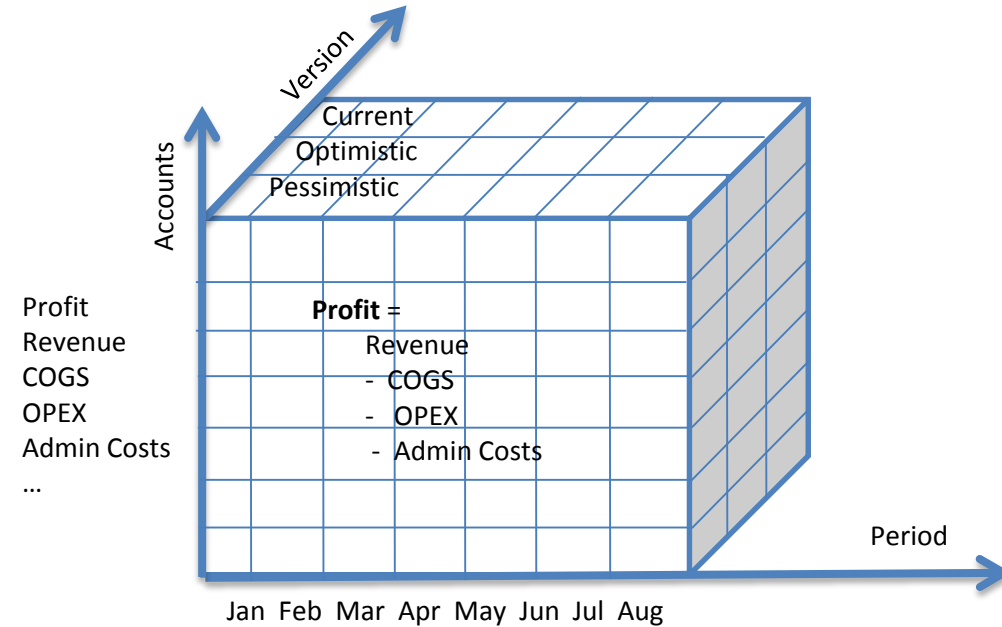
## Financials

Account	Version	Period	Amount
Revenue	Current	Jan	3000
COGS	Current	Jan	-1500
OPEX	Current	Jan	-400
Admin_costs	Current	Jan	-400
Revenue	Current	Feb	3200
COGS	Current	Feb	-1800
OPEX	Current	Feb	-350
Admin_costs	Current	Feb	-400
...			

```
select
    sum (fin.amount) Profit
from Table1 fin
where
    fin.scenario = 'Current'
group by Period
```

## Bussines formula

$$\text{Profit} = \text{Revenue} - \text{COGS} - \text{OPEX} - \text{Admin Costs}$$



```
FIX (
    "Current",           /*only current scenario */
    @relative("Periods",0), /*all periods */
)
"Profit" =
    + "Revenue"
    + "COGS"
    + "OPEX"
    + "Admin_costs";

endfix
```

# Relational DB vs. OLAP (reporting)

Task: Calculate profit for current scenario

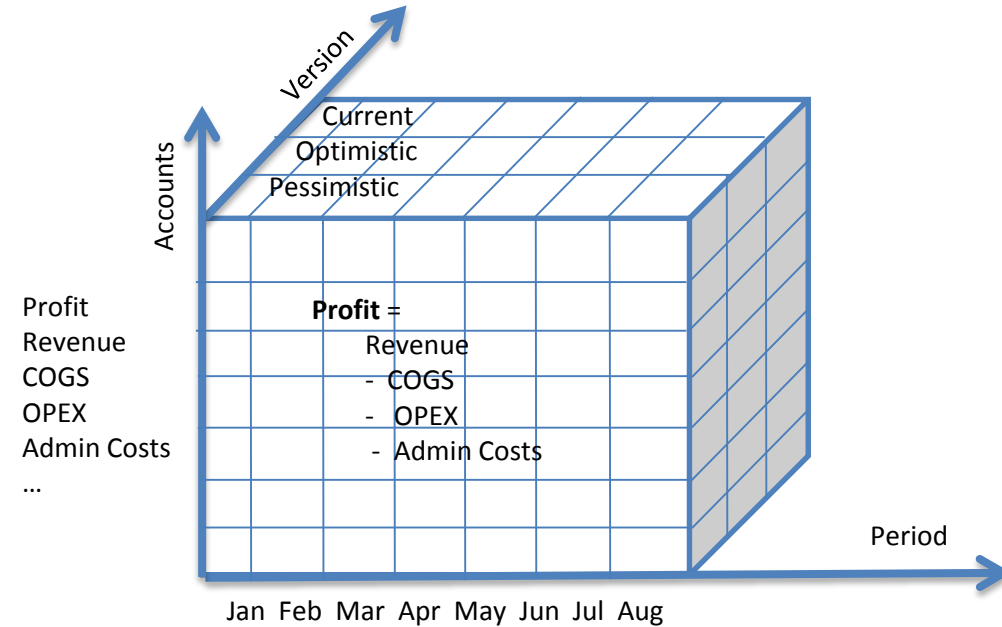
## Financials

Account	Version	Period	Amount
Revenue	Current	Jan	3000
COGS	Current	Jan	-1500
OPEX	Current	Jan	-400
Admin_costs	Current	Jan	-400
Revenue	Current	Feb	3200
COGS	Current	Feb	-1800
OPEX	Current	Feb	-350
Admin_costs	Current	Feb	-400
...			

```
select
  fin.account,
  fin.amount
from Table1 fin
where
  1=1
  and fin.scenario = 'Current'
  and fin.period = 'Jan'
```

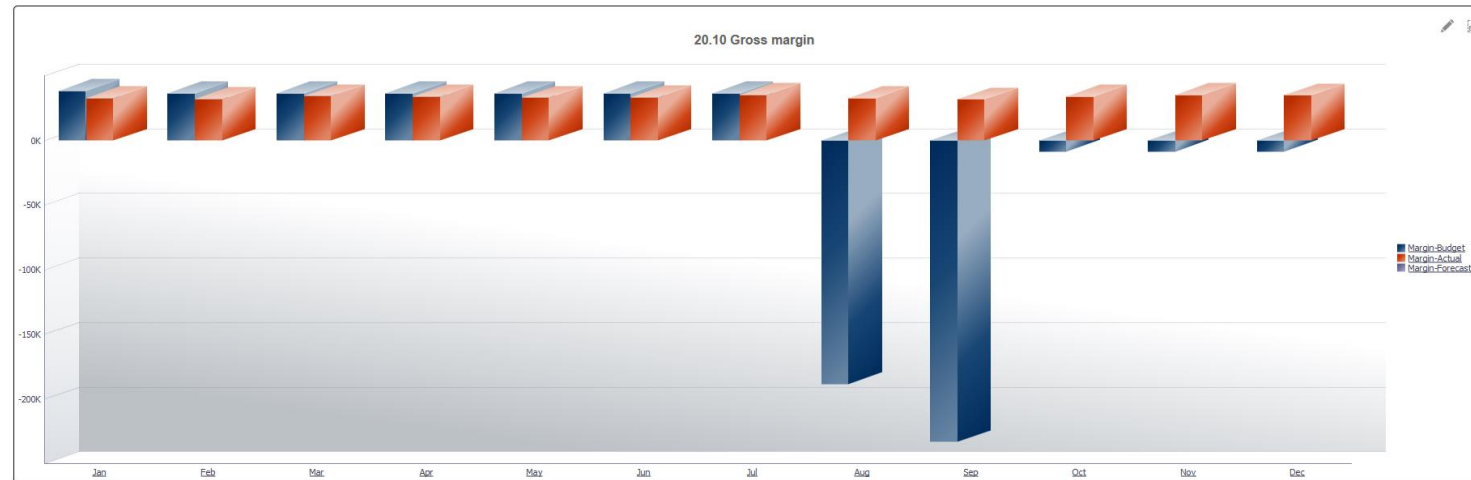
## Bussines formula

$$\text{Profit} = \text{Revenue} - \text{COGS} - \text{OPEX} - \text{Admin Costs}$$



Period: Jan Scenario: Current

Revenue	3 000
COGS	- 1 500
OPEX	- 400
Admin_costs	- 400



Why it happens?

What is going on?



- Review data from different point of view
- Check assumptions
- Compare
- Recalculate

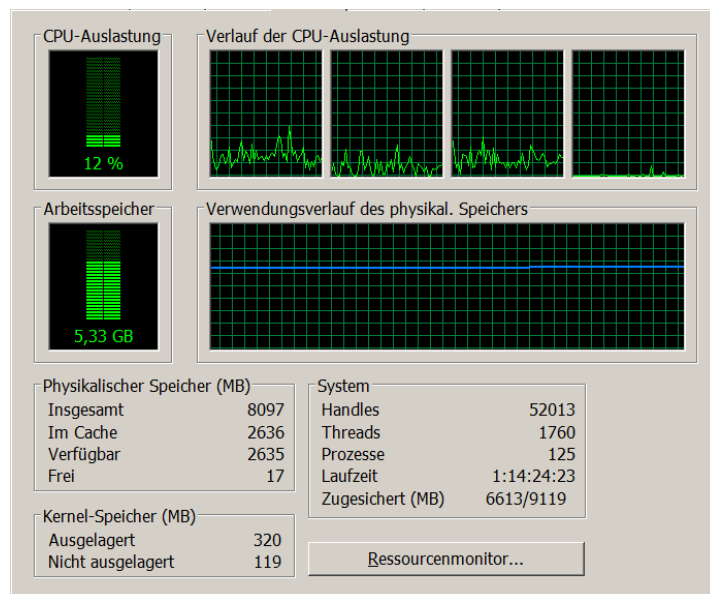
Before lose one's trains of thoughts

## Performance

- Application Design
  - Dimensions
  - Hierarchies
  - Dense and Sparse
- Business Rules
  - FIX Statement
  - Calculations
  - Block Creation
  - Aggregation
- Forms
  - POV
  - Retrieving data
- Hardware

## Extendibility

- Application Design
  - Quantity dimensions
  - Levels
  - Block size
- Business Rules
  - Code
- Forms
  - POV
  - Retrieving data
- Hardware



## 1. Structure

```
1  FIX (
2      "Dim1mbr1", "Dim1mbr2",      /*Aliases*/
3      "Dim2mbr1",                  /*Alias*/
4      "Dim3mbr2"                   /*Alias*/
5  )
6
7  FIX (
8      "Dim4mbr1"                   /*Alias*/
9  )
10
11  /* Comments to calc */
12      "Dim5mbr1" =                  /*Alias*/
13      "Dim5mbr2"                   /*Alias*/
14      + "Dim5mbr3"                 /*Alias*/
15      - "Dim5mbr4";                /*Alias*/
16
17  ENDFIX
18  Dim4mbr1 (
19      IF (
20          Conditions
21      )
22      /* Comments to calc */
23          "Dim4mbr1" =              /*Alias*/
24          Dim4mbr2->"Dim5mbr1"      /*Alias*/
25          + "Dim4mbr3"->"Dim5mbr6"; /*Alias*/
26      ELSE
27          "Dim4mbr1" =              /*Alias*/
28          #missing;
29      ENDIF
30  );
31  ENDFIX
```



Level 1. Parameters



Level 2. Rule



Level 3. Calculation

Correct	Wrong
@LEVMBRS("Time Periods",0) AND @DESCENDANTS("Year Total")	Jan, Feb, Mar, Apr, may, Jun, Jul, Aug, Sep, Oct, Nov, Dec
@REMOVE(@Relative("YearTotal",0), "Dec")	Jan, Feb, Mar, Apr, may, Jun, Jul, Aug, Sep, Oct, Nov
@UDA("Account","FA_TO_PL_FA_1")	„PL_5000000“
{Version} and "Target")	IF (@ISMBER(„Target“))
IF (@ISMBER(„JAN“))	FIX („JAN“)
@CHILDREN ("Year Total")	Q1,Q2,Q3,Q4
@WITHATTR(Products, "==" , „New")	„Product_1“

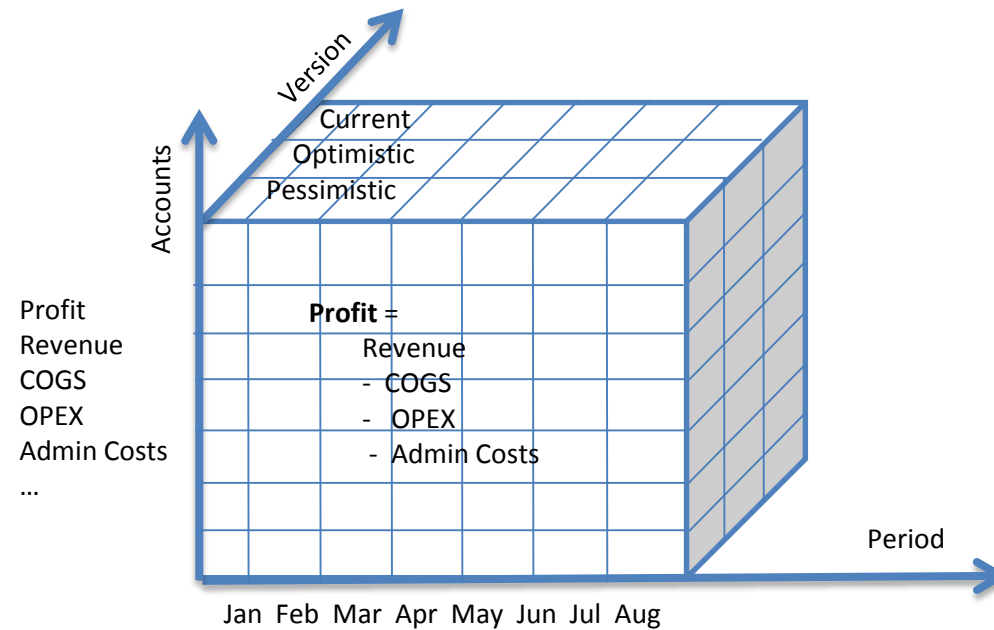
"FIX – Sparse, IF - Dense".



# Calculation

## 1. Dense Calculations

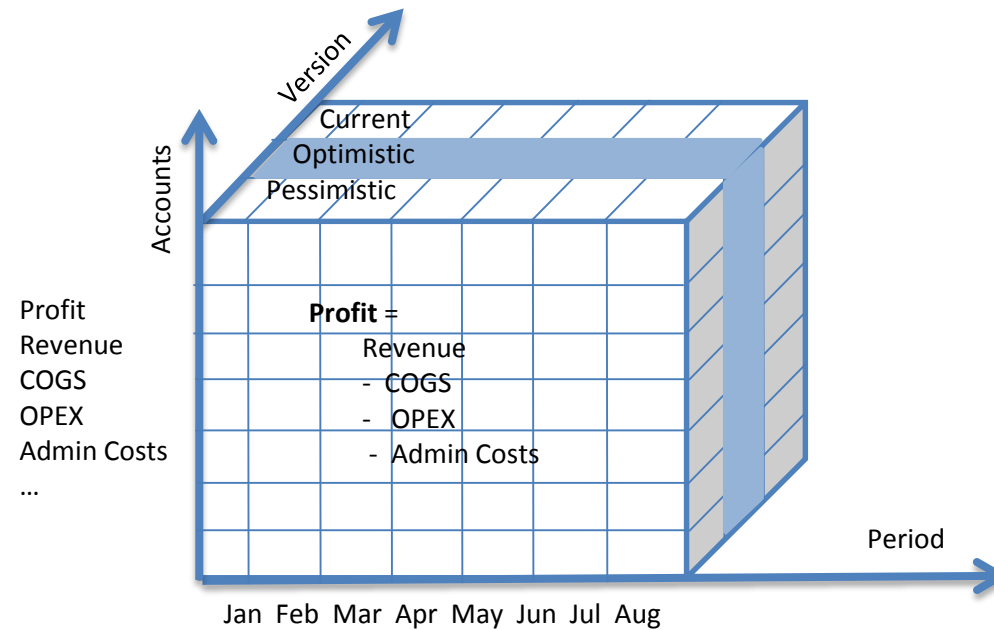
- Dense calculation are fast



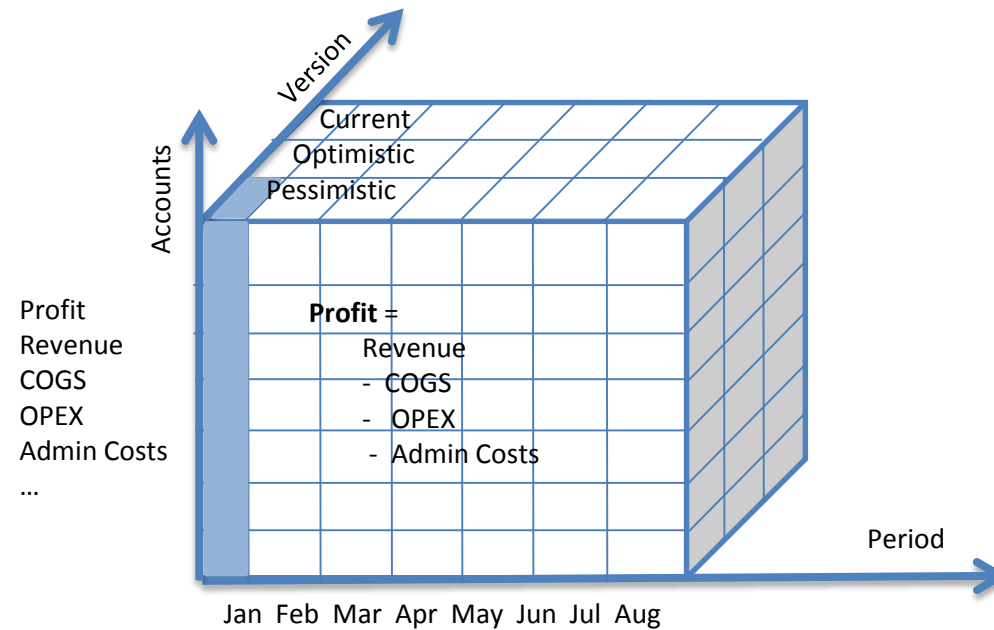
# Calculation

## 2. Dense Calculations

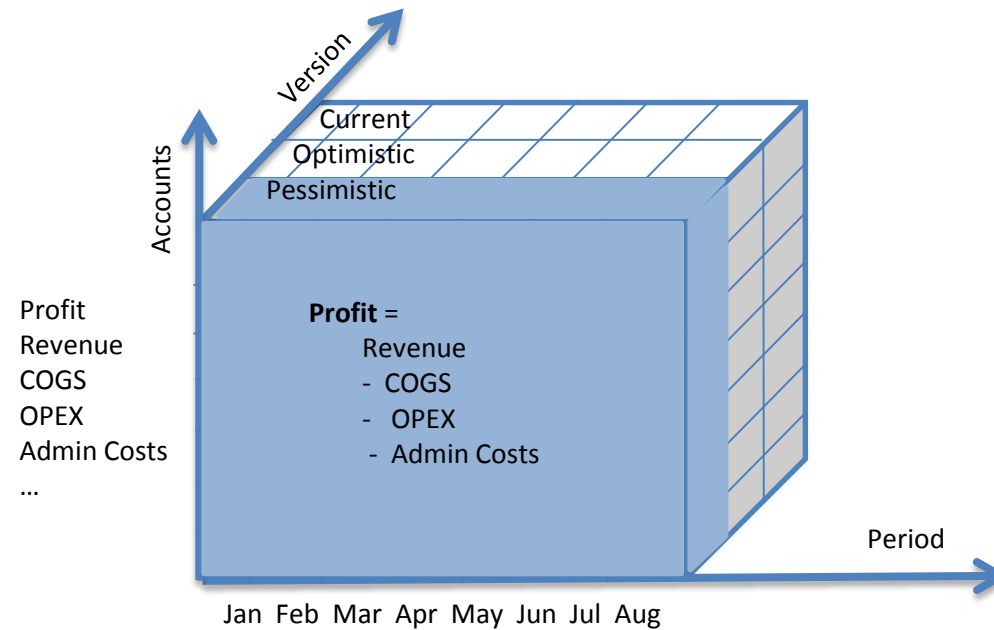
- Dense calculations are fast



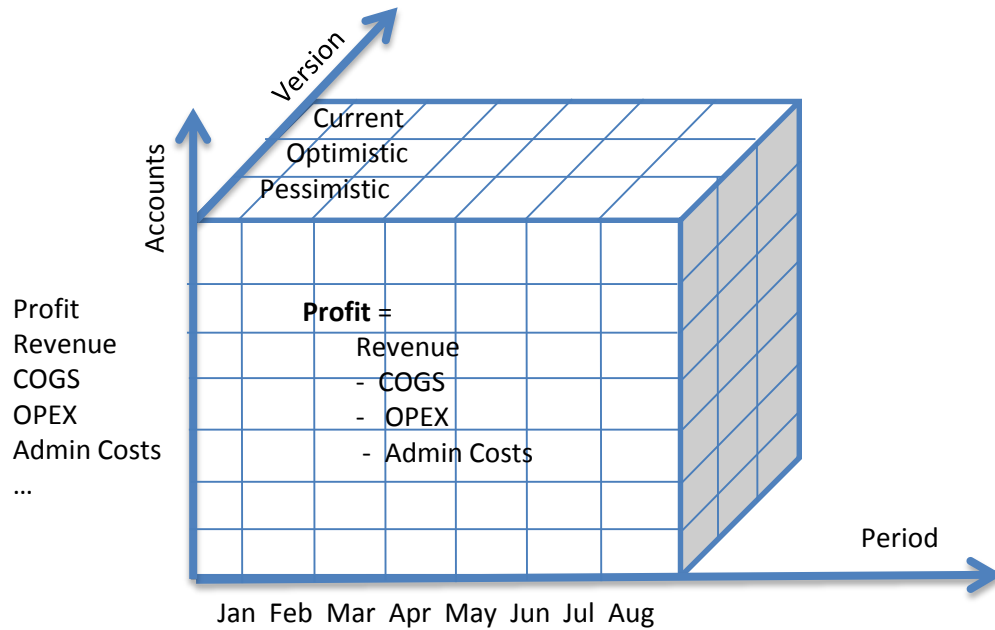
- Dense calculations are fast



- Dense calculations are fast



- **Dense calculation is faster!**



```
4  FIX (
5      "Revenue",                /*Alias*/
6      @Relative("YearTotal",0) /*all months*/
7  )
8  /* Comments to calc */
9      "Optimistic" =           /*Optimistic version*/
10     "Current"                /*Current version*/
11     * 1.2;                   /*Assumption*/
12  ENDFIX
```

```
15  FIX (
16     "Optimistic",             /*Optimistic version*/
17     @Relative("YearTotal",0) /*all months*/
18  )
19  /* Comments to calc */
20     "Revenue" (              /* Account */
21     IF (
22         "Revenue"-> "Current"<>0 /* if data exist on Current version */
23     OR "Revenue"-> "Current" <> #MISSING /* if data exist on Current version */
24     )
25     "Revenue" =
26     "Revenue"-> "Current"
27     * 1.2;
28     ENDFIX;
29  );
30  ENDFIX
```

### All calculations with Level0

#### Correct

```
36  FIX (
37      @relative ("Dim4mbr1",0)
38  )
39
40  /* Comments to calc */
41      "Dim5mbr1" =
42          "Dim5mbr2"
43          + "Dim5mbr3"
44          - "Dim5mnr4";
45  ENDFIX
```

#### Wrong

```
36  FIX (
37      @idescendants ("Dim4mbr1")
38  )
39
40  /* Comments to calc */
41      "Dim5mbr1" =
42          "Dim5mbr2"
43          + "Dim5mbr3"
44          - "Dim5mnr4";
45  ENDFIX
```

# Calculation

## 7. Performance Improvement

### Fewer members – best performance

	A	B	C	D	E	F	G	H	I	J	K	L	M
1		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2	Net income												
3	EBT												
4	EBIT												
5	EBITDA												
6	Revenue												
7	Procurement of raw materials and goods												
8	Change of stock												
9	Direct costs												
10	OPEX												
11	Commercial expenses												
12	Research and Development expenses												
13	Administration expenses												
14	Personnel expenses												
15	Expenses for IT												
16	Depreciation												
17	Interest income and related income												
18	Interest expense and similar expenses												
19	Taxes												

### Fewer members – best performance

12

	A	B	C	D	E	F	G	H	I	J	K	L	M
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1													
2	Net income												
3	EBT												
4	EBIT												
5	EBITDA												
6	Revenue												
7	Procurement of raw materials and goods												
8	Change of stock												
9	Direct costs												
10	OPEX												
11	Commercial expenses												
12	Research and Development expenses												
13	Administration expenses												
14	Personnel expenses												
15	Expenses for IT												
16	Depreciation												
17	Interest income and related income												
18	Interest expense and similar expenses												
19	Taxes												

18

```
15  FIX (
16      "Optimistic",           /*Optimistic version*/
17      @Relative("YearTotal",0) /*all months*/
18  )
19  /* Comments to calc */
20      "Revenue" (           /* Account */
21      IF (
22          "Revenue"->"Current"<>0           /* if data exist on Current version
23      OR "Revenue"->"Current" <> #MISSING     /* if data exist on Current version
24      )
25          "Revenue" =
26              "Revenue"->"Current"
27              * 1.2;
28      ENDIF;
29  );
30  ENDFIX
```



# Create Block

## 1. Best Performance Command

- DATACOPY
- @JExportTo и JImport.
- @CALCMODE within TOPDOWN.
- Aggregation on sparse dimension
- Sparse calculation
- @CreateBlock

# Create Block

## 2. @CALCMODE

```
19  FIX (
20      "Dim1mbr1", "Dim1mbr2",          /*Aliases*/
21      "Dim2mbr1",                      /*Alias*/
22      "Dim3mbr2"                        /*Alias*/
23  )
24      "Dim4mbr1" (
25          ..... @CALCMODE (TOPDOWN);
26          ..... "Dim5mbr1"="Dim5mbr2"*1;
27      )
28
29  ENDFIX
30
```

# Create Block

## 3. Sparse Calculation

- Sparse calculation without cross-dim

```
19  FIX (
20      "Dim1mbr1", "Dim1mbr2",          /*Aliases*/
21      "Dim2mbr1",                      /*Alias*/
22      "Dim3mbr2"                       /*Alias*/
23  )
24      "Dim4mbr1" (
25          .....
26          "Dim5mbr1" -> "Dim6mbr1"=0;
27          .....
28      );
29  .....
30  ENDFIX
```

# Create Block

## 4. @CreateBlock

```
1  FIX (
2      "Dim1mbr1", "Dim1mbr2",      /*Aliases*/
3      "Dim2mbr1",                  /*Alias*/
4      "Dim3mbr2"                  /*Alias*/
5  )
6      Dim4mbr1 (
7          IF (
8              Conditions
9          )
10         /* Comments to calc */
11         @CREATEBLOCK ("Dim4mbr1");
12         ENDIF
13     );
14
15 ENDFIX
```

# Create Block

## 5. Low Performance

Better to avoid:

- SET CREATENONMISSINGBLK ON
- @ALLOCATE
- @XREF
- @XWRITE

# Aggregation

## 1. Tips

Better to avoid:

- Aggregation
- Complex multi level hierarchies
- Flat hierarchies
- Use ASO for reporting



## Evgeniy Galanzovsky

Senior Consultant

**PROMATIS software GmbH**

**Pforzheimer Str. 160**

**76275 Ettlingen (Karlsruhe TechnologyRegion), Germany**

**Phone +49 7243 2179 0**

**Fax +49 7243 2179 99**

**Email:** [evgeniy.galanzovsky@promatis.com](mailto:evgeniy.galanzovsky@promatis.com)

**Web:** [www.promatis.com](http://www.promatis.com)

[www.horus.biz](http://www.horus.biz)

[www.prociris.biz](http://www.prociris.biz)