OLAP

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OLAP example

We have a solution

- Change management [changemanagement]

The solution contains the following lookup fields

- Scope [TYPE]
- Type [TASKTYPE]

It also has some decimal values

- Estimate [ESTIMATE]
- Realized [REALIZED]

In our reporting we want to see distributions by

- A period hierarchy: Year / Quarter / Month
- Categories by Scope, Type and Status

Setting up the cube

A new OLAP cube is set up in: "Integration" > "OLAP cubes" > "Add"

Basic information

- Name display: sample1
- Cube header: Report sample1

Cube definition ("Cube Schema XML")

For further help to designing schemas please refer to the following ressources

- http://mondrian.pentaho.com/documentation/schema.php

```
<Cube name="sample1cube">
  <Table name="data_changemanagement"/>
  <Dimension name="Scope" foreignKey="TASKTYPE">
    <Hierarchy hasAll="true" primaryKey="LookupID">
    <Table name="formfieldlookup"/>
      <Level name="Type" column="Value" uniqueMembers="true"/>
    </Hierarchy>
  </Dimension>
  <Dimension name="Type" foreignKey="TYPE">
    <Hierarchy hasAll="true" primaryKey="LookupID">
    <Table name="formfieldlookup"/>
      <Level name="Type" column="Value" uniqueMembers="true"/>
    </Hierarchy>
  </Dimension>
  <Dimension name="Status" foreignKey="StatusID">
    <Hierarchy hasAll="true" primaryKey="StatusID">
    <Table name="formstatus"/>
      <Level name="Type" column="Status" uniqueMembers="true"/>
    </Hierarchy>
  </Dimension>
  <Dimension name="Period" type="TimeDimension">
    <Hierarchy name="Periode" hasAll="true" allMemberName="All period">
      <Table name="data_changemanagement"/>
      <Level name="Aar" levelType="TimeYears" uniqueMembers="true">
        <KeyExpression>
          <SQL dialect="mysql">Year(CreatedAt)</SQL>
          <SQL dialect="generic">YEAR</SQL>
        </KeyExpression>
      </Level>
      <Level name="Kvartal" uniqueMembers="false" levelType="TimeQuarters">
        <KeyExpression>
          <SQL dialect="mysql">Quarter(CreatedAt)</SQL>
          <SQL dialect="generic">Quarter</SQL>
        </KeyExpression>
      </Level>
      <Level name="Maaned" uniqueMembers="false" levelType="TimeMonths">
        <KeyExpression>
          <SQL dialect="mysql">Month(CreatedAt)</SQL>
          <SQL dialect="generic">Month</SQL>
```

```
      </KeyExpression>
    </Level>
  </Hierarchy>
 </Dimension>
 <Measure name="Revision" column="Revision" aggregator="sum" formatString="Standard"/>
 <Measure name="Estimate" column="ESTIMATTIMER" aggregator="sum" formatString="Standard"/>
 <Measure name="Realized" column="REALISERETTIMER" aggregator="sum" formatString="Standard"/>
</Cube>
```

MDX query ("Cube Query MDX")

For further help to designing queries please refer to the following ressources

- http://technet.microsoft.com/en-us/library/ms145971.aspx

```
SELECT
  NON EMPTY {([Measures].[Estimate],[Measures].[Realized])} ON COLUMNS,
  NON EMPTY {([Period],[Type],[Status])} ON ROWS
FROM [sample1cube]
```

Results

The cube is acccesed via this URL (or press "test" form the OLAP overview)
http://YOUR_DOMAIN/TempusServa/olapview.jsp?query=sample1

Report sample1



			Measures
Periode	Type	Status	Estimate
All period	All Types	All Statuss	289

Report sample1



			Measures
Periode	Type	Status	Estimate
All period	All Types	All Statuss	289
2009	All Types	All Statuss	5
2010	All Types	All Statuss	173
	Bugfix	All Statuss	12
	Feature	All Statuss	101
		New item	31
		Roadmap	70
	Optimize	All Statuss	60
2011	All Types	All Statuss	89
2012	All Types	All Statuss	22

Schema cheatsheet

Introduction

The below paragraphs contains sample snippets for your OLAP schema.

Precise documentation on how to define a schema, can be found at:
http://mondrian.pentaho.com/documentation/schema.php

Schema structure overview

- Table (one):
  - Structure: The centre table containing the measures (FACT table)
  - OLAP cube: *Not displayed*

- Dimensions (many)
  - Structure: Related tables or groupable values (FACT table relations)
  - OLAP cube: Columns/row "headers" in the cube

- Measures (many)
  - Structure: Values found in the centre table (FACT table values)
  - OLAP cube: Numbers to be displayed in the table cells

Defining dimensions for related values

Standard lookup value

The cube schema below only needs adjustment for the system name of the lookup field.

Structure

Solution as displayed	"Sample solution" : "Category" = xxx
Solution system names	sample : CATEGORY = xxx
Database table names	data_sample : CATEGORY = xxx

Data model

- data_sample
  - CATEGORY: Field containing the lookup value

Cube schema

```
...
<Dimension name="Example" foreignKey="CATEGORY">
  <Hierarchy hasAll="true" primaryKey="LookupID">
    <Level name="Category" column="Value" uniqueMembers="true" />
  </Hierarchy>
</Dimension>
...
```

Simple choice value

The cube schema below only needs adjustment for the system name of the lookup field.

Structure

Solution as displayed	"Sample solution" : "My choice" = xxx
Solution system names	sample : CHOICE = xxx
Database table names	data_sample : CHOICE = xxx

Data model

- data_sample
  - CHOICE: Field containing the lookup value

Cube schema

```
...
<Dimension name="Example" foreignKey="CHOICE">
  <Hierarchy hasAll="true" primaryKey="ChoiceID">
    <Level name="Answer" column="Value" uniqueMembers="true" />
```

```
  </Hierarchy>
</Dimension>
...
```

Standard record Status

The cube schema below can be copied directly without modification: The status properties and tablenames are allways the same.

Structure

Solution as displayed	"Sample solution" : "Status" = xxx
Solution system names	sample : "StatusID" = xxx
Database table names	data_sample "StatusID" = xxx

Data model

- data_sample
  - StatusID: Field containing status reference (allways the same)

Cube schema

```
...
<Dimension name="Example" foreignKey="StatusID">
  <Hierarchy hasAll="true" primaryKey="StatusID">
    <Level name="Status" column="Status" uniqueMembers="true" />
  </Hierarchy>
</Dimension>
...
```

Defining dimensions for related records

Related solution ONE step away

Structure

Solutions as displayed	"Some child" : "Parent" -> "Father or mother"
Solution system names	child : PARENT -> parent
Database table names	data_child : PARENT -> data_parent

Data model

- data_child
  - PARENT: Key to the "parent" solution
- data_parent
  - GRANDPARENT: Key to the "grandparent" solution
  - PARENTNAME: Descriptive field

Cube schema

```
...
<Dimension name="Example" foreignKey="PARENT">
  <Hierarchy hasAll="true" primaryKey="DataID" primaryKeyTable="data_parent">
    <Level name="Parent" column="PARENTNAME" uniqueMembers="true" />
  </Hierarchy>
</Dimension>
...
```

Related solution TWO steps away

Note that the schemas for multi join tables are written from "inside out", that might seem counterintuitive i relation to what you want to display in the cube later.

Structure

Solutions as displayed	"Some child" : "Parent" -> "Father or mother" : "Grand parent" -> "Grandma and Grandpa's"
Solution system names	child : PARENT -> parent : GRANDPARENT -> grandparent
Database table names	data_child : PARENT -> data_parent : GRANDPARENT -> data_grandparent

Data model

- data_child
  - PARENT: Key field pointing to the "parent" solution
- data_parent
  - GRANDPARENT: Key field pointing to the "grandparent" solution

    - PARENTNAME: Descriptive field

- data_grandparent
    - GRANDPARENTNAME: Descriptive field

Cube schema

```
...
<Dimension name="Example" foreignKey="PARENT">
  <Hierarchy hasAll="true" primaryKey="DataID" primaryKeyTable="data_parent">
    <Join leftKey="GRANDPARENT" rightKey="DataID" />
    <Level name="Grandparent" table="data_grandparent" column="GRANDPARENTNAME"
uniqueMembers="true" />
    <Level name="Parent" table="data_parent" column="PARENTNAME" uniqueMembers="true" />
  </Hierarchy>
</Dimension>
...
```

Defining dimensions for inline values

Text values

Cube schema

```
...
<Dimension name="Category">
   <Hierarchy hasAll="true">
      <Level name="Name" column="NAME" uniqueMembers="true"/>
   </Hierarchy>
</Dimension>
...
```

Year/integer values

Cube schema

```
...
<Dimension name="Period" type="TimeDimension">
    <Hierarchy hasAll="true">
        <Level name="Aar" column="YEAR" type="Numeric" uniqueMembers="false" levelType="TimeYears"/>
    </Hierarchy>
</Dimension>
...
```

Date / datetime values

Cube schema

```
...
<Dimension name="Period" type="TimeDimension">
  <Hierarchy name="Periode" hasAll="true" allMemberName="All period">
    <Level name="Aar" levelType="TimeYears" uniqueMembers="true">
      <KeyExpression>
        <SQL dialect="mysql">Year(CreatedAt)</SQL>
        <SQL dialect="generic">YEAR</SQL>
      </KeyExpression>
    </Level>
    <Level name="Maaned" uniqueMembers="false" levelType="TimeMonths">
      <KeyExpression>
        <SQL dialect="mysql">Month(CreatedAt)</SQL>
        <SQL dialect="generic">Month</SQL>
      </KeyExpression>
    </Level>
  </Hierarchy>
</Dimension>
...
```

Enumeration values

Cube schema

```
...
<Dimension name="Severity">
   <Hierarchy hasAll="true" primaryKey="SEVERITY">
      <InlineTable alias="enumeration">
      <ColumnDefs>
         <ColumnDef name="id" type="Numeric"/>
         <ColumnDef name="desc" type="String"/>
      </ColumnDefs>
      <Rows>
         <Row>
            <Value column="id">1</Value>
            <Value column="desc">High</Value>
         </Row>
         <Row>
            <Value column="id">2</Value>
            <Value column="desc">Medium</Value>
         </Row>
         ... more values ...
      </Rows>
   </InlineTable>
   <Level name="Severity" column="id" nameColumn="desc" uniqueMembers="true"/>
</Hierarchy>
</Dimension>
...
```

Defining measures

Normal values

Measures are allways numeric values, that can be agggated to higher levels (the levels in the dimensions)

Type	Aggregator	Examples
Sums	SUM	Time spent, costs
Average	AVG	Process time

Calculated values

Analyse Activity

User activity will display an OLAP cube for **changes and updates** to certain solutions.

Changes are defined by updates to the underlying record.

How to activate this feature

- User must have the **Business analyst** property set
- The solution must have **Activity monitoring** property set
- The service **OLAP Activity** must be active

Analyse Flowsteps

User activity will display an OLAP cube for **flow in each process step** for certain solutions.

The total flow time is defined as the time span between entry and exit point in time for each flow step (status).

Furthermore each status can have targets for good performance defined:

- Goal: Expected process time in this step
- Tolerance: Acceptable process time in this step

How to activate this feature

- User must have the **Business analyst** property set
- The solution must have **Activity monitoring** property set
- The service **OLAP Flowsteps** must be active

Analyse Flowtotal

User activity will display an OLAP cube for **total flow** time to certain solutions.

The total flow time is defined as the time span between creation and point in time where a final status i reached.

Furthermore each solution can have targets for good performance defined:

- Goal: Expected total process time
- Tolerance: Acceptable total process time

How to activate this feature

- User must have the **Business analyst** property set
- The solution must have **Activity monitoring** property set
- The service **OLAP Flow total** must be active