

BAR-DISPLAY SCENARIO: MODEL TYPE GRAPHREP

Scenario Description



- **Goal:** To display a model in the drawing area in the form of a set of bars, with attributes for objects neatly displayed in the appropriately labelled bar. The model itself can be both a graph or a pool and the objects (modelling instances) are centrally displayed in the Modelling Area. The values of some selected attributes are displayed on both sides on the modelling area, as defined by the developer.
- **Case:** This solution allows the activation/deactivation of the bar display, selecting the orientation of the modelling area (horizontal/vertical), selection of visible attributes (bars) and much more.








Modelling Language to demonstrate Bar Display View GraphRep:

1. New model types: *Business Process Diagram*, *Document Model*.
2. New classes: `__ModelTypeMetaData__`, *Task*, *Document*, *Start*, *End*, *subsequent*.

Used ADOxx Functionality: Model type Graphrep



Introduction
Setup of Implementation Environment

Modelling Language Implementation	
Classes	
Relations	
Class Attributes and Attributes	
GRAPHREP	
ATTRREP	
CLASS Cardinality	
CONVERSION	
Model Pointer	
Attribute Facets	
Model Types	

Mechanisms & Algorithms Implementation	
	Core Functions for Model Manipulation
	Database
	Visualisation
	Query
	Transformation
	Configuration of ADOxx Components
	Visualisation
	Query
	External Coupling ADOxx Functionality
	ADOscript Triggers
	ADOscript Language Constructs
	Visualisation ADOscript
	Visualisation Expression
	Query ADOscript
	Transformation ADOscript
	ADD-ON Implementation
	ADOxx Web-Service
	XML / ADL Import – Export
	ADOscriptBatch Mode

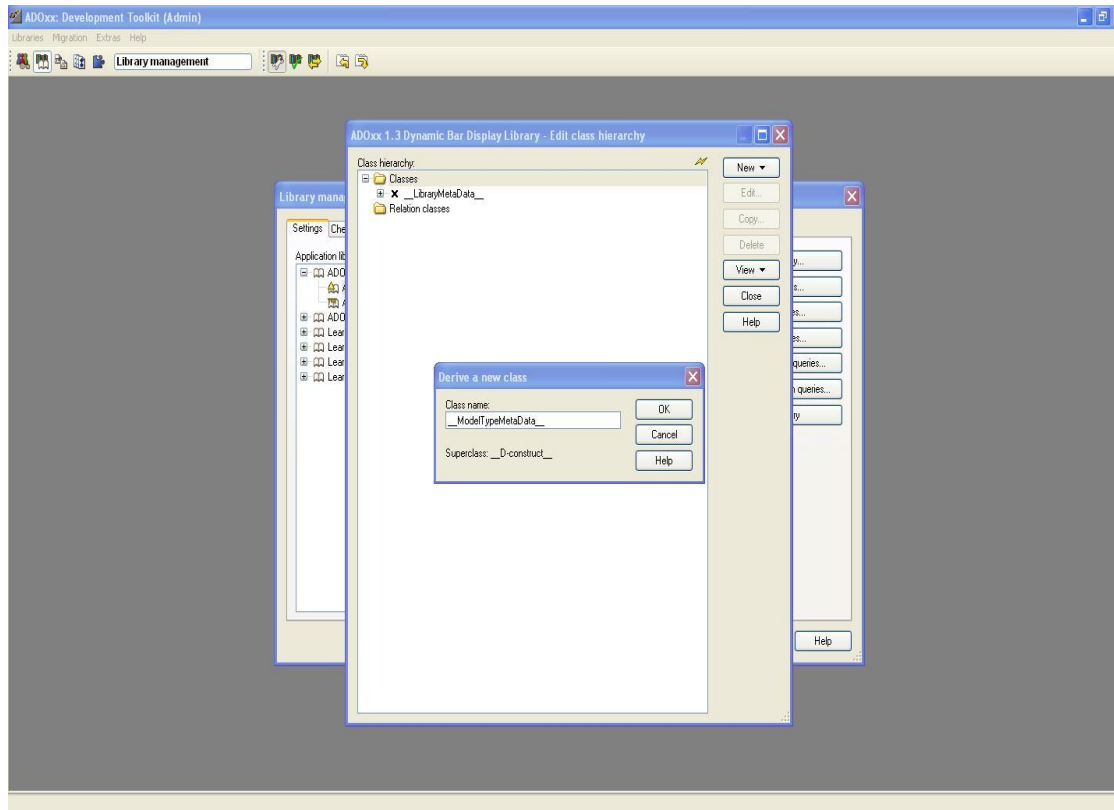


HANDS-ON

BAR-DISPLAY

**SCENARIO:
MODELTYPE GRAPHREP**

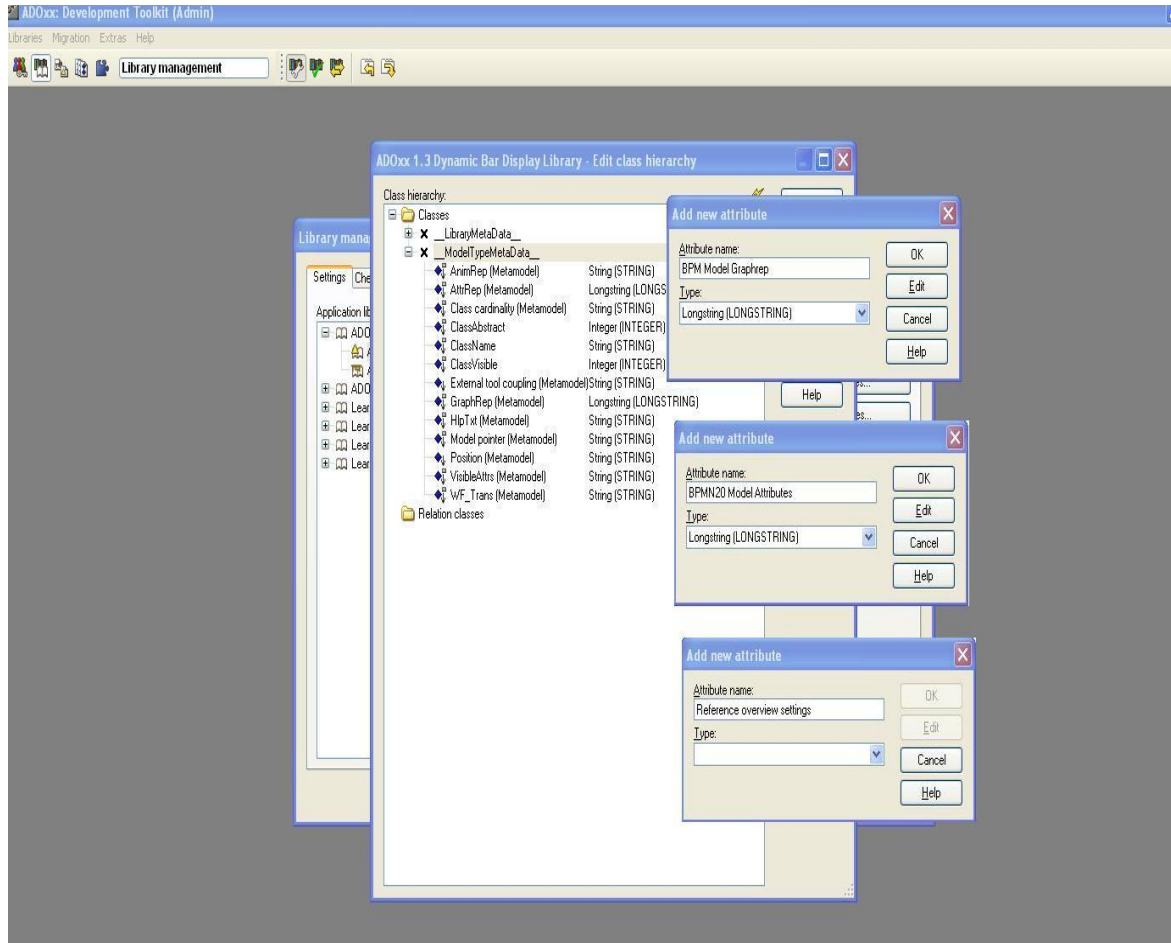
Create new class `__ModelTypeMetaData__`



New classes:

- Go to the *Library management*, select a dynamic library and click *Class hierarchy*.
- Click *View* and select *Metamodel*.
- Select *__D-construct__* (*Metamodel*)
- Click *New* → *New class*; name it `__ModelTypeMetaData__` (two underscore signs!)

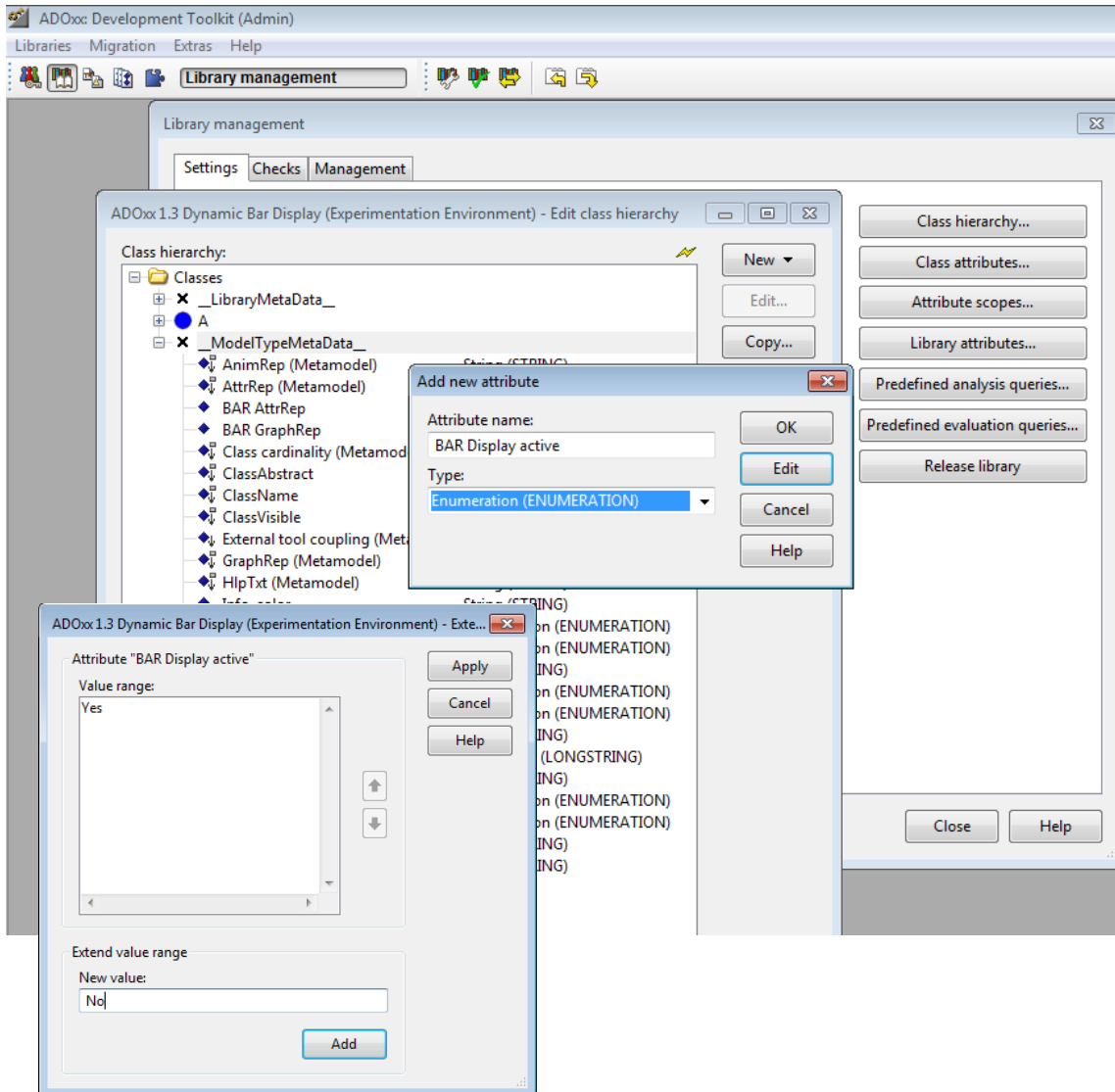
Add new attributes to class `__ModelTypeMetaData__`



Add attributes:

- Select class `__ModelTypeMetaData__`
- Click *New* → *New attribute...*
- Name new attributes and select type according figure on the left side:
 - *BPM Model Graphep; Longstring*
 - *BPMN20 Model Attributes; Longstring*
 - *Reference overview settings; Longstring.*

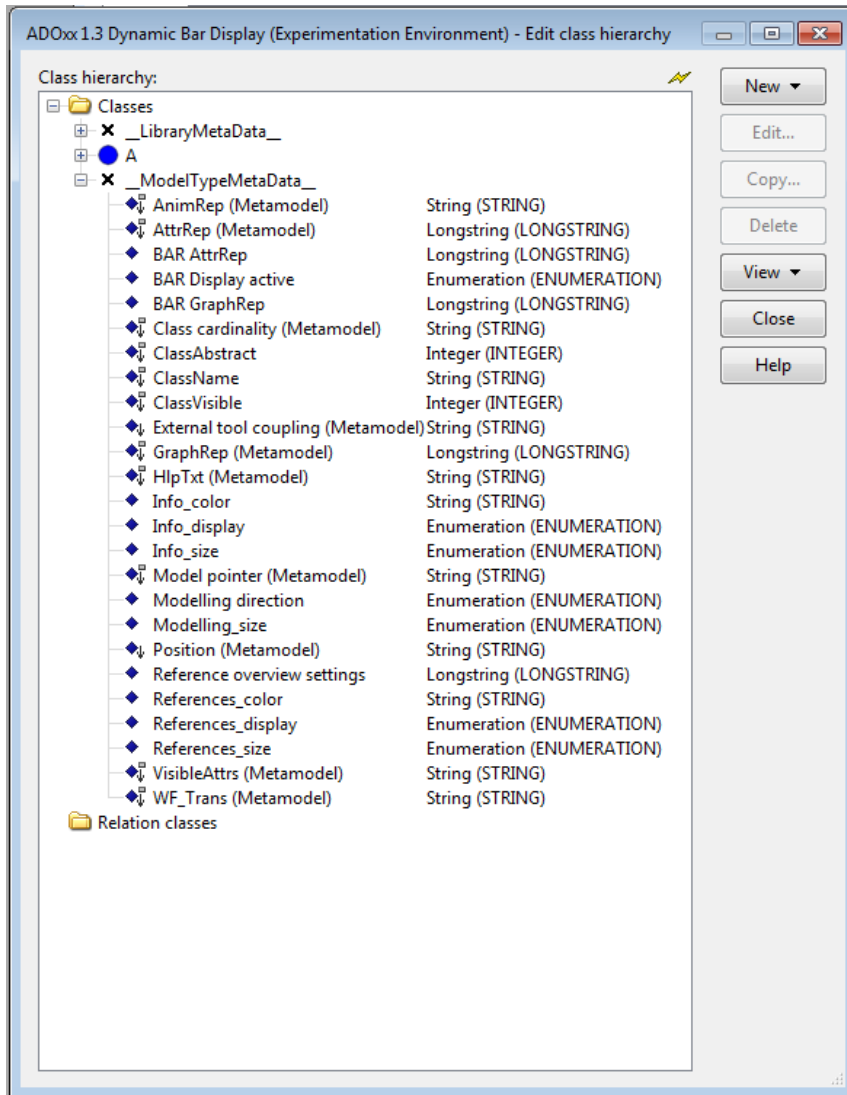
Add new attributes to class `__ModelTypeMetaData__`



Add *Enumeration* attribute:

- Select class `__ModelTypeMetaData__`
- Click *New* → *New attribute...*
- Name new attribute *BAR Display active* and set type to *Enumeration*.
- Click *OK* and add the values *Yes* and *No*: type *Yes* into the *New value* input bar, click *Add* and do the same for *No*.
- Finally click *Apply*.

Add new attributes to class `__ModelTypeMetaData__`



Add further attributes

•The following additional attributes are needed:

- Name: *Documents and Resources_color*, type: *String*.
- Name: *Documents and Resources_display*, type: *Enumeration*, values: *Yes, No*.
- Name: *Documents and Resources_size*, type: *Enumeration*, values: *1, 2, 3, 4, 5, 6, 8, 10*.
- Name: *Modelling direction*, type: *Enumeration*, values: *horizontal, vertical*.
- Name: *Modelling_size*, type: *Enumeration*, values: *1, 2, 3, 4, 5, 6, 8, 10*.
- Name: *Description_color*, type: *String*.
- Name: *Description_display*, type: *Enumeration*, values: *Yes, No*.
- Name: *Description_size*, type: *Enumeration*, values: *1, 2, 3, 4, 5, 6, 8, 10*.

Configuring *BAR AttrRep* attribute



Set standard value

- Double click “BPMN20 Model Attributes” attribute, set Standard value to:

CHAPTER "BAR Display"

ATTR "BAR Display active" ctrltype: check checked-value: "Yes"
unchecked-value: "No"

AVAL s_Aktiv: "BAR Display active"

ATTR "Modelling direction" ctrltype: radio enabled: (s_Aktiv = "Yes")

ATTR "Modelling_size"

GROUP "Documents and Resources"

ATTR "Documents and Resources_display" ctrltype: check checked-value: "Yes" unchecked-value: "No" enabled: (s_Aktiv = "Yes")

ATTR "Documents and Resources_color" dialog: color enabled: ((s_Aktiv = "Yes") AND (s_References_display = "Yes"))

ATTR "Documents and Resources_size"

ENDGROUP

GROUP "Description"

ATTR "Description_display" ctrltype: check checked-value: "Yes" unchecked-value: "No" enabled: (s_Aktiv = "Yes")

AVAL s_Description_display: "Description_display"

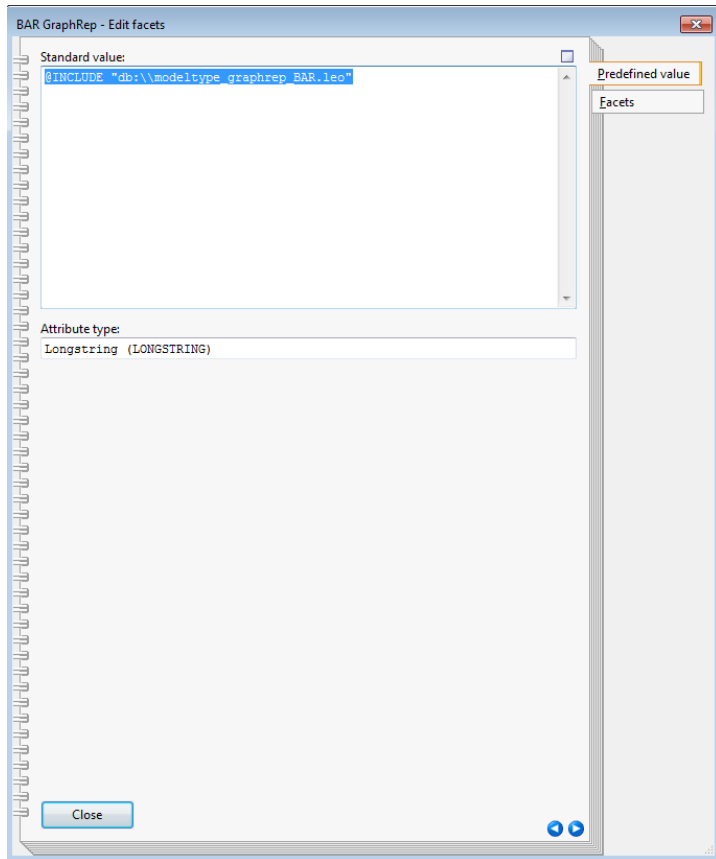
ATTR "Description_color" dialog: color enabled: ((s_Aktiv = "Yes") AND (s_Description_display = "Yes"))

ATTR "Description_size"

ENDGROUP

- Click *Close*.

Configuring *BPM Model Graphrep* attribute



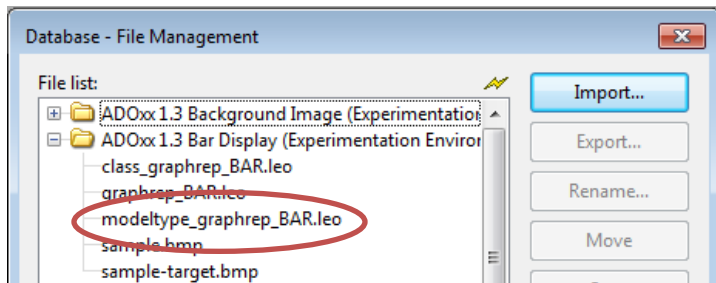
Set standard value

- Double click “BPM Model Graphrep” attribute, set Standard value to:

```
@INCLUDE "db:\\modeltype_graphrep_BAR.leo"
```

- Click *Close*.

- make sure that the file `modeltype_graphrep_BAR.leo` is contained in the database of the current library (close the *Library management* and go to *Extras* → *File management...*).



BPM Model Graphrep code



```
GRAPHREP layer:-3
SHADOW off
```

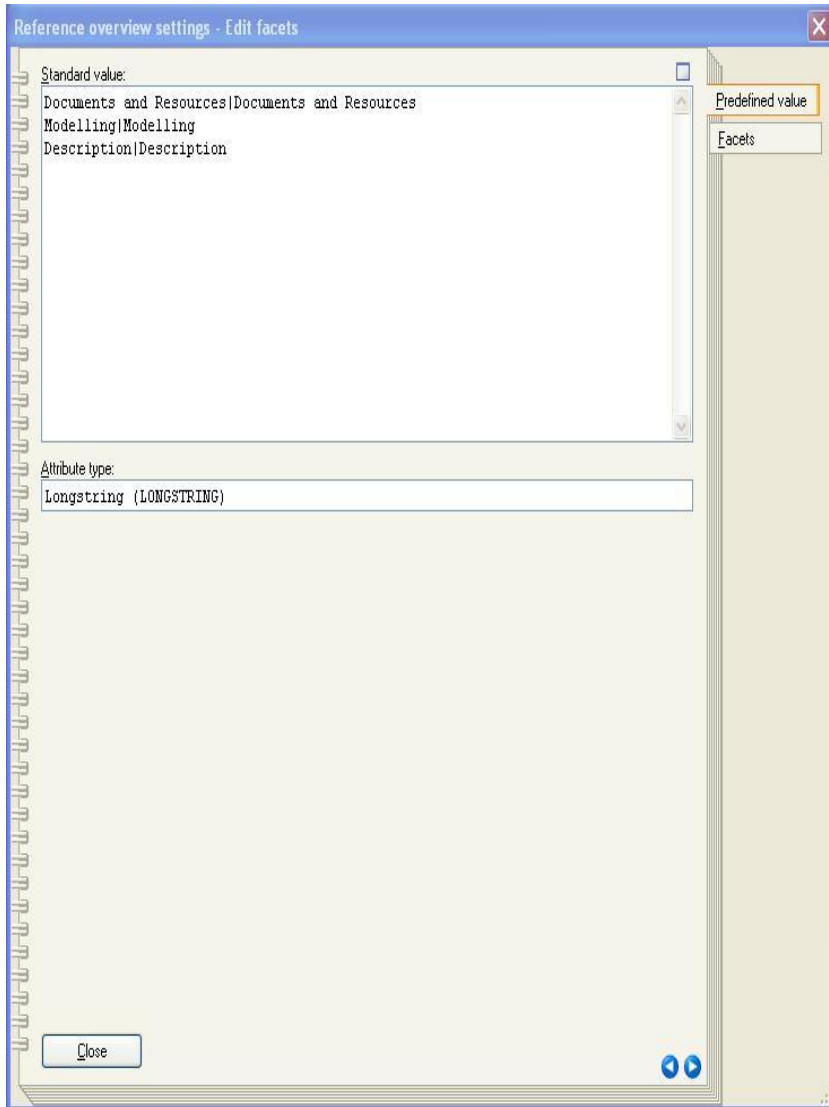
```
AVAL set-default:"vertical" modDirection:"Modelling direction"
AVAL sNav: "BAR Display active"
```

```
#-----
# make header with (model) description
#-----
IF (sNav = "Yes")
{
  FONT h:10pt
  ATTR "Description" x:0.5cm y:(texty2 + 0.3cm) w:l:10cm h:t:2cm
```

```
#-----
# make BARs
#-----
FONT h:9pt bold
SET cmDefaultLaneSize:2cm
# read "Reference overview settings"-attribute:
AVAL sRefOverviewInfo:"Reference overview settings"
```

```
SET cmX:(0.0cm)
SET cmY:(1cm)
PEN color:gray w:1pt
SET sSepLine:"\n"
SET sSepToken:"|"
FOR sLaneInfo in:(sRefOverviewInfo) sep:(sSepLine)
{
  ...
```

Configuring *Reference overview settings* attribute



Set standard value

- Double click Reference overview settings attribute, set Standard value to:

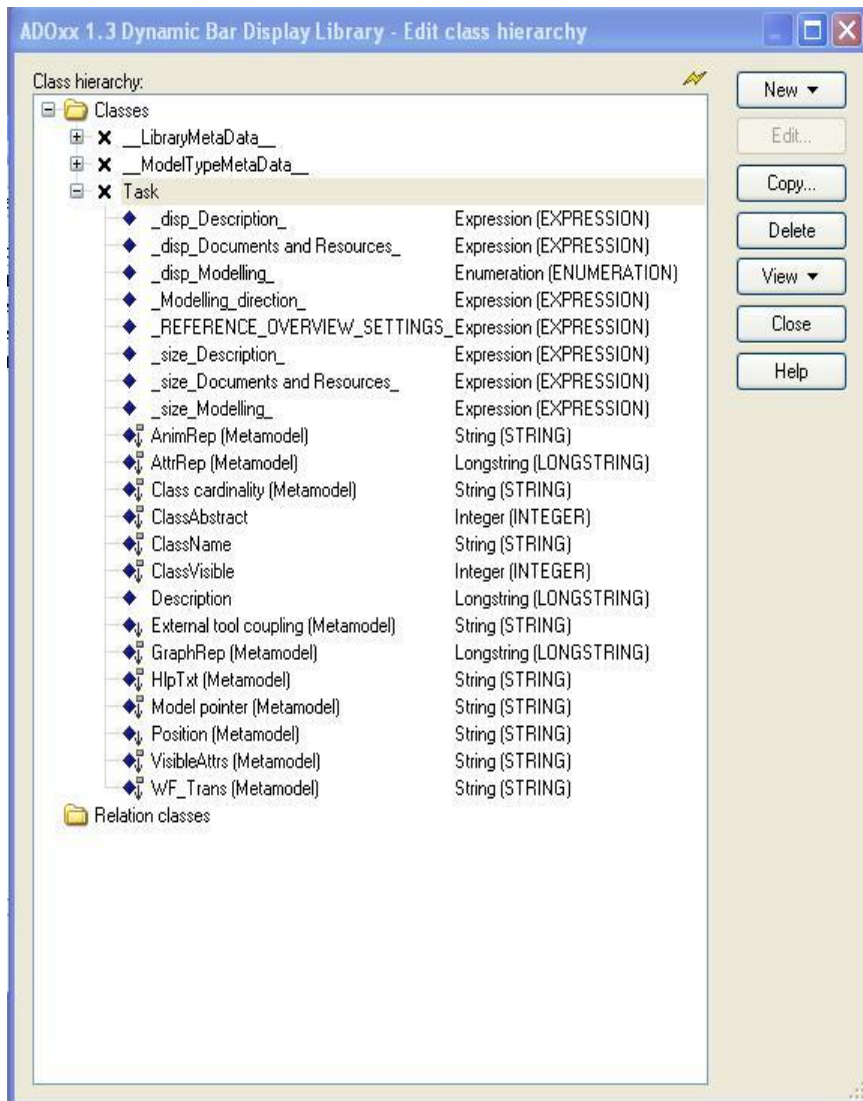
Description|Description

Modelling|Modelling

Documents and Resources|Documents and Resources

- Click *Close*.

Create new class Task; superclass: `__D-construct__` (Metamodel)

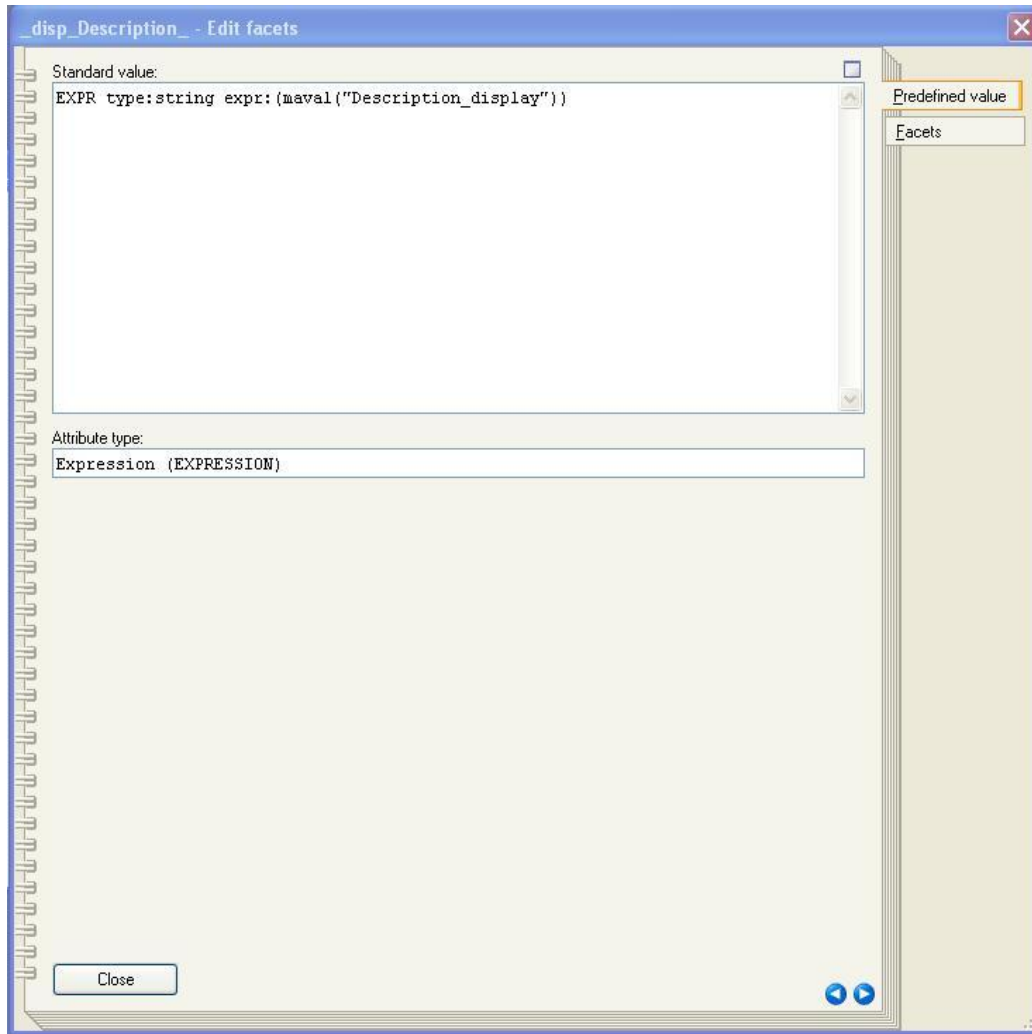


Add attributes to class `Task`

•The following attributes are needed:

- Name: `_disp_Description_`, type: `Expression`.
- Name: `_disp_Modelling_`, type: `Expression`.
- Name: `_disp_Documents and Resources_`, type: `Expression`.
- Name: `_Modelling_direction_`, type: `Expression`.
- Name: `_REFERENCE_OVERVIEW_SETTINGS_`, type: `Expression`.
- Name: `_size_Description_`, type: `Expression`.
- Name: `_size_Modelling_`, type: `Expression`.
- Name: `_size_Documents and Resources_`, type: `Expression`.
- Name: `Description`, type: `Longstring`.
- Name: `BoolBarDisplayActive`: type: `Expression`, Val: `EXPR` type: `string`
`expr:(maval("BAR Display active"))`

Configuring values of *Expression* attributes in class *Task*



- Double click on *_disp_Description_* attribute

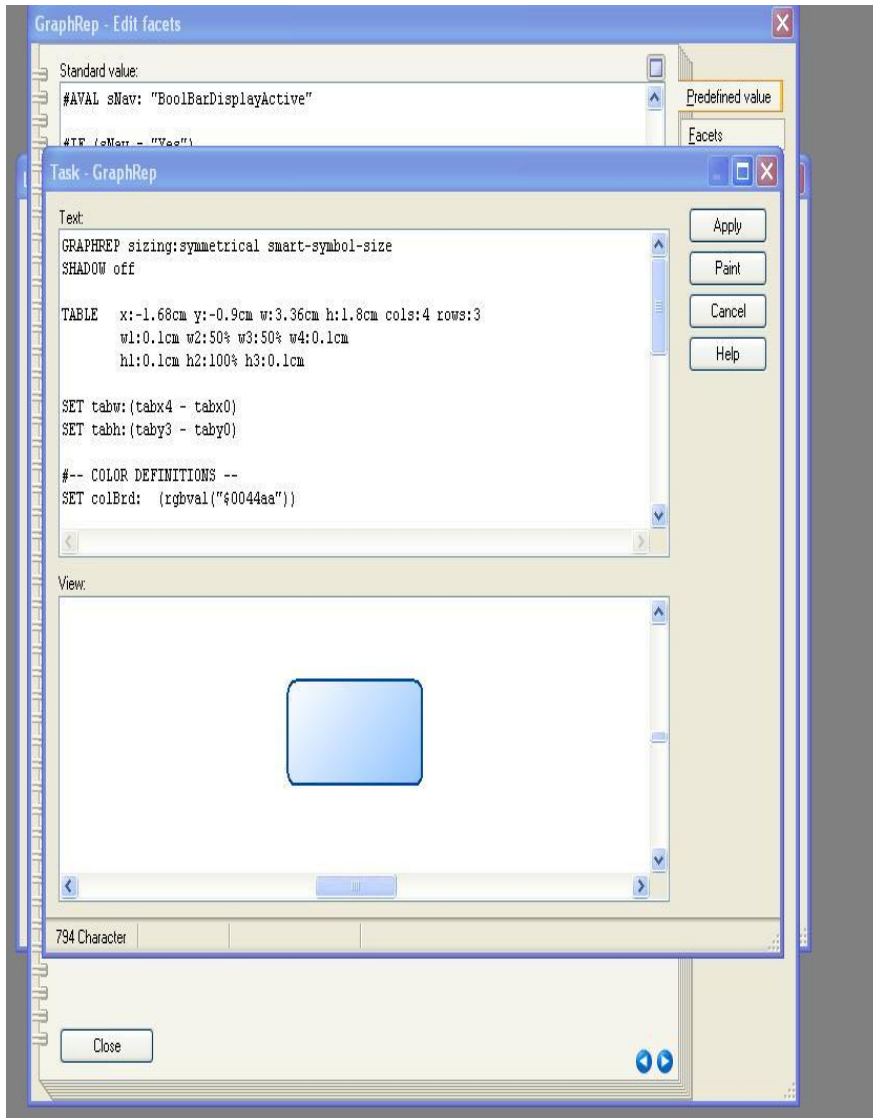
- Set *Standard value*:

```
EXPR type:string  
expr:(maval("Description_display"))
```

Name of corresponding attribute in class
__ModelTypeMetaData__

- Analogously define values of remaining *Expression* attributes.

Configuring GraphRep for class *Task*



- Go to class *Task*.
- Double click *GraphRep (Metamodel)*.
- Click the *Dialog* button.
- Enter the text on the following page
- Make sure that the file `class_graphrep_BAR.leo` is contained in the database. The code for this is also shown on the following slides
- Click *Apply*, then *close*.

Configuring GraphRep for class *Task*



```
GRAPHREP sizing:symmetrical smart-symbol-size  
SHADOW off
```

```
TABLE x:-1.68cm y:-0.9cm w:3.36cm h:1.8cm cols:4 rows:3  
w1:0.1cm w2:50% w3:50% w4:0.1cm  
h1:0.1cm h2:100% h3:0.1cm
```

```
SET tabw:(tabx4 - tabx0)  
SET tabh:(taby3 - taby0)
```

```
#-- COLOR DEFINITIONS --  
SET colBrd: (rgbval("$0044aa"))  
SET colFFm: (rgbval("white"))  
SET colFTo: (rgbval("$8FC2FF"))  
PEN style:solid
```

```
CLIP_ROUNDRECT x:(tabx0) y:(taby0) w:(tabw) h:(tabh) rx:.2cm ry:.2cm  
GRADIENT_RECT x:(tabx0) y:(taby0) w:(tabw) h:(tabh) style:downdiag  
color1:(colFFm) color2:(colFTo)  
CLIP_OFF
```

```
PEN w:0.06cm color:(colBrd)
```

```
ROUNDRECT x:(tabx0) y:(taby0) w:(tabw) h:(tabh) rx:.2cm ry:.2cm
```

```
ATTR "Name" x:(tabx2) y:(taby0+(tabh2/2)-(sizeSigne/2)+0.16cm) w:c:(tabw - (nWidthReduction)) h:c:(tabh2-0.1cm) line-break:rigorous
```

```
AVAL sNav: "BoolBarDisplayActive"
```

```
IF (sNav = "Yes")  
@INCLUDE "db:\\class_graphrep_BAR.leo"  
ENDIF
```

Adding GraphRep for class *Task*: class_graphrep_BAR.leo code



```
#Define amount of space for displaying attribute values:
SET cmDisplayHeight:2cm
SET cmDisplayHeight2:4cm

#read "Modelling direction" and "Reference overview settings" attributes [via corresponding expression attributes]:
AVAL modDirection:"_Modelling_direction_"
AVAL sREFERENCE_OVERVIEW_SETTINGS:"_REFERENCE_OVERVIEW_SETTINGS_"

#define seperators for "Reference overview settings" attribute:
SET sSepLine:"\n"
SET sSepToken:"|"

#-----
# Vertical navigation overview:
#-----
IF (modDirection = "vertical")
{
  SET cmX:0.08cm
  SET cmY:-0.75cm
  FONT "Arial" h:8pt color:black
  PEN color:darkgray outline
  FOR sLaneInfo in: (sREFERENCE_OVERVIEW_SETTINGS) sep: (sSepLine)
  {
    SET sLaneName:(token(sLaneInfo, 0, sSepToken))
    SET cmLaneSize:("_size_" + sLaneName + "_")
    AVAL set-default: "2" sLaneSize: ( cmLaneSize)
    SET laneSize: ( (CM VAL sLaneSize)*5)

    SET bShowLane: "No"
    AVAL set-default: "No" bShowLane:("_disp_" + sLaneName + "_")
    IF (bShowLane = "Yes")
    {
      IF (sLaneName != "Modelling") {
        ATTRBOX (sLaneName) line-break:rigorous x:abs:(cmX) y:(cmY) w:l:(laneSize - 0.16cm) h:t:(cmDisplayHeight)
        ATTR (sLaneName) format:"%o %m" x:abs:(cmX) y:(cmY) w:l:(laneSize - 0.16cm) h:t:(cmDisplayHeight) line-break:rigorous
      }
    }
  }
}
```

Adding GraphRep for class *Task*: class_graphrep_BAR.leo code



```
SET cmX:(cmX + laneSize)
}
}
}

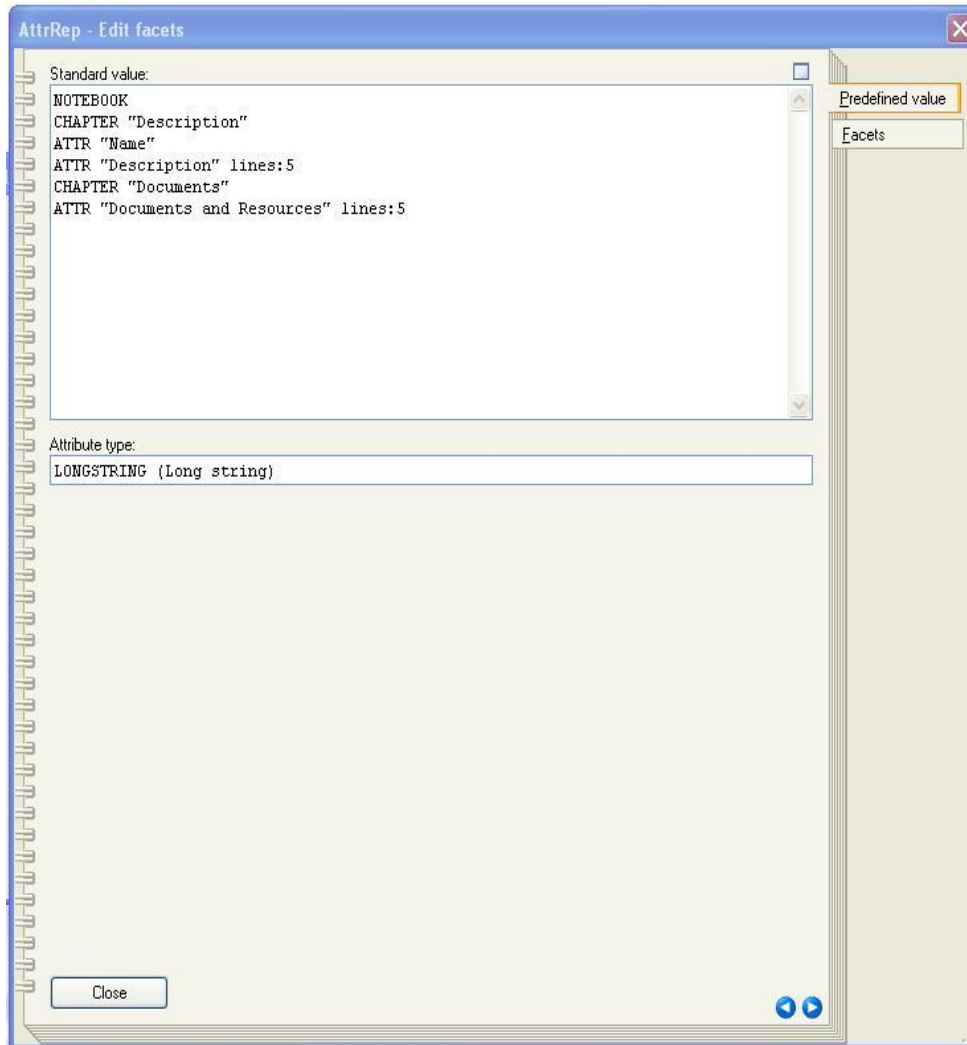
#-----
# Horizontal navigation overview
#-----
ELSE {
  FONT h:12pt bold
  TEXTBOX "A" x:1cm y:0.2cm
  SET cmY:(texty2 + 2.3cm)
  SET cmX:-1.6cm
  FONT "Arial" h:8pt color:black
  PEN color:darkgray outline

  FOR sLaneInfo in:(sREFERENCE_OVERVIEW_SETTINGS) sep:(sSepLine)
  {
    SET sLaneName:(token(sLaneInfo, 0, sSepToken))
    SET cmLaneSize:("_size_" + sLaneName + "_")
    AVAL set-default: "2" sLaneSize: ( cmLaneSize)
    SET laneSize: ( (CM VAL sLaneSize)*5)

    SET bShowLane: "No"
    AVAL set-default: "No" bShowLane:("_disp_" + sLaneName + "_")

    IF (bShowLane = "Yes")
    {
      IF (sLaneName != "Modelling") {
        ATTRBOX (sLaneName) line-break:rigorous x:(cmX) y:abs:(cmY) w:l:(cmDisplayHeight2) h:(laneSize - 0.16cm)
        ATTR (sLaneName) format:"%o %m" x:(cmX) y:abs:(cmY) w:l:(cmDisplayHeight2) h:t:(laneSize - 0.16cm) line-break:rigorous
      }
      SET cmY: (cmY + laneSize)
    }
  }
}
}
```

Configuring AttrRep for class *Task*

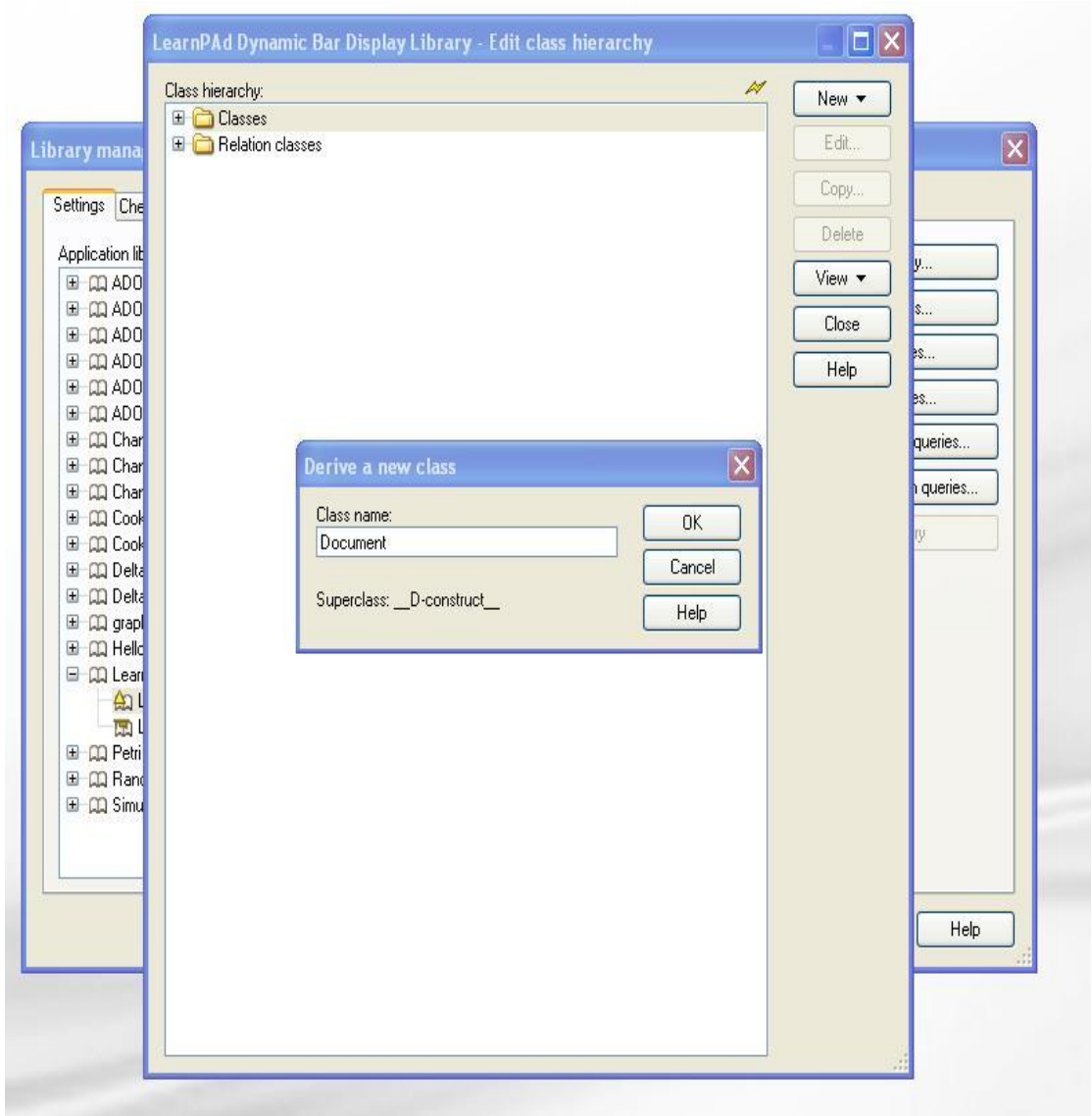


- Go to class *Task*.
- Double click *AttrRep (Metamodel)*.
- Click the *Dialog* button.
- Enter the text on the following page

```
NOTEBOOK
CHAPTER "Description"
ATTR "Name"
ATTR "Description" lines:5
CHAPTER "Documents"
ATTR "Documents and Resources" lines:5
```

- Click *Apply*, then *close*.

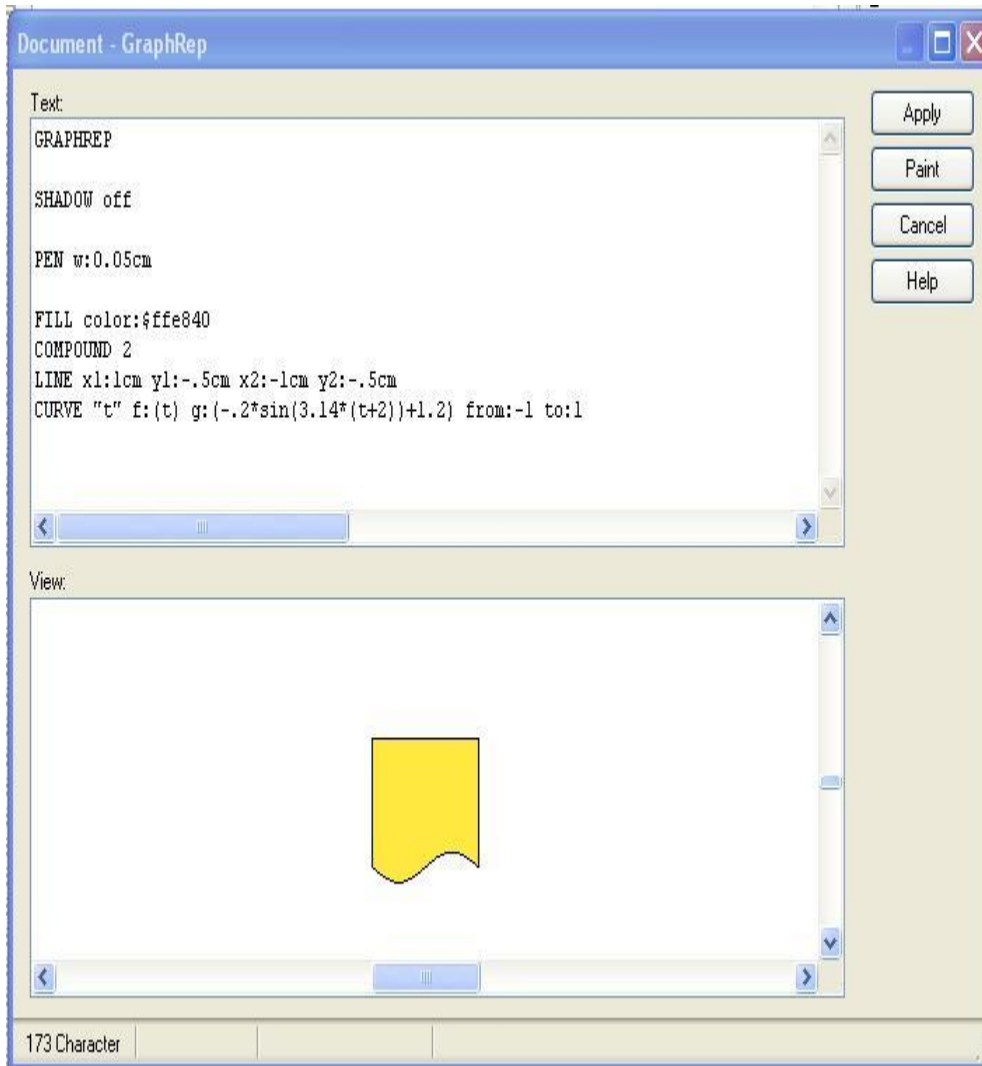
Create new class Document; superclass: `__D-construct__` (Metamodel)



New classes:

- Go back to the *Library management*, select current dynamic library and click *Class hierarchy*.
- Click *View* and select *Metamodel*.
- Select `__D-construct__` (*Metamodel*)
- Click *New* → *New class*; name it *Document*

Configuring GraphRep for class *Document*



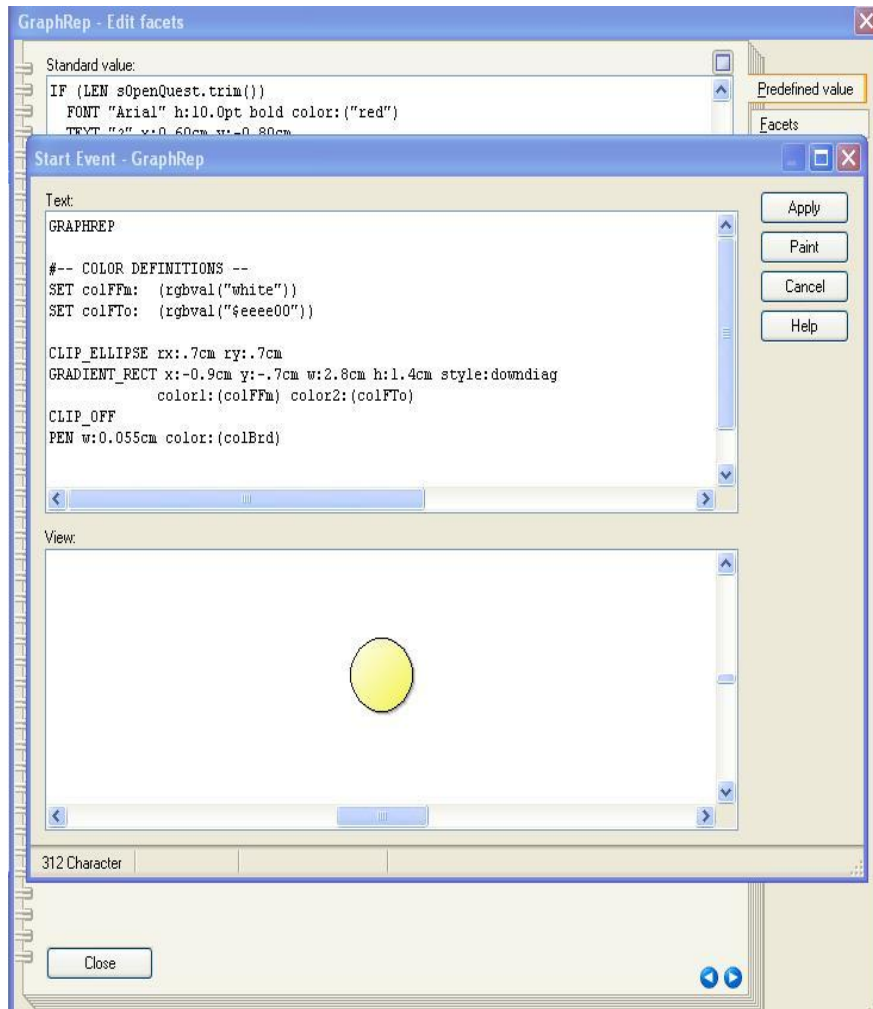
- Go to class *Document*.
- Double click *GraphRep (Metamodel)*.
- Click the *Dialog* button.
- Enter:

```
GRAPHREP
SHADOW off
PEN w:0.05cm
FILL color:$ffe840
COMPOUND 2
LINE x1:1cm y1:-.5cm x2:-1cm y2:-.5cm
CURVE "t" f:(t) g:(-.2*sin(3.14*(t+2))+1.2)
from:-1 to:1
ATTR "Name" y:1.6cm w:c:2.8cm h:t
```

Create new class Start; superclass: `__D-construct__` (Metamodel) and Configure GraphRep



- Create Class *Start*
- Go to class *Start*.
- Double click *GraphRep (Metamodel)*.
- Click the *Dialog* button.
- Enter:



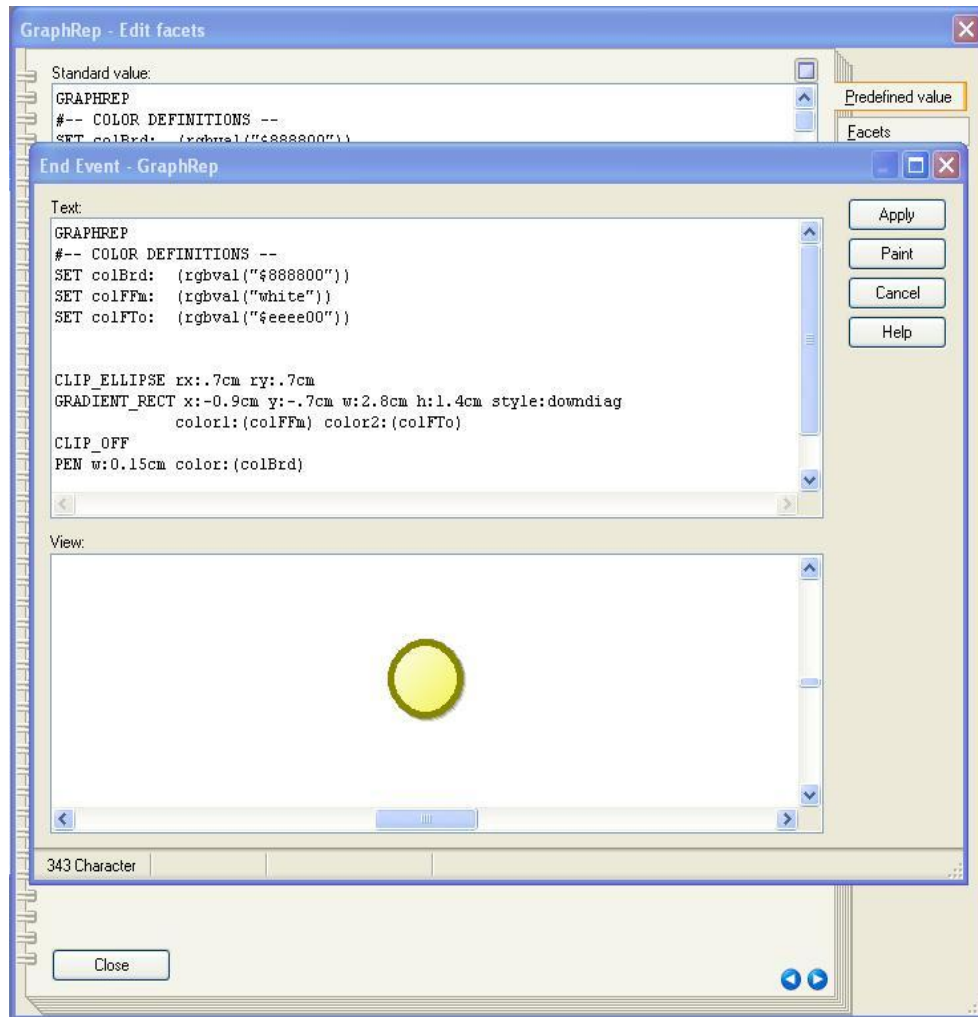
```
GRAPHREP
#-- COLOR DEFINITIONS --
SET colFFm: (rgbval("white"))
SET colFTo: (rgbval("$eeee00"))

CLIP_ELLIPSE rx:.7cm ry:.7cm
GRADIENT_RECT x:-0.9cm y:-.7cm w:2.8cm
             h:1.4cm style:downdiag
             color1:(colFFm) color2:(colFTo)
CLIP_OFF
PEN w:0.055cm color:(colBrd)
ELLIPSE rx:.7cm ry:.7cm
```

Create new class *End*; superclass: `__D-construct__` (Metamodel) and Configure *GraphRep*



- Create Class *End*
- Go to class *End*.
- Double click *GraphRep* (Metamodel).
- Click the *Dialog* button.
- Enter:

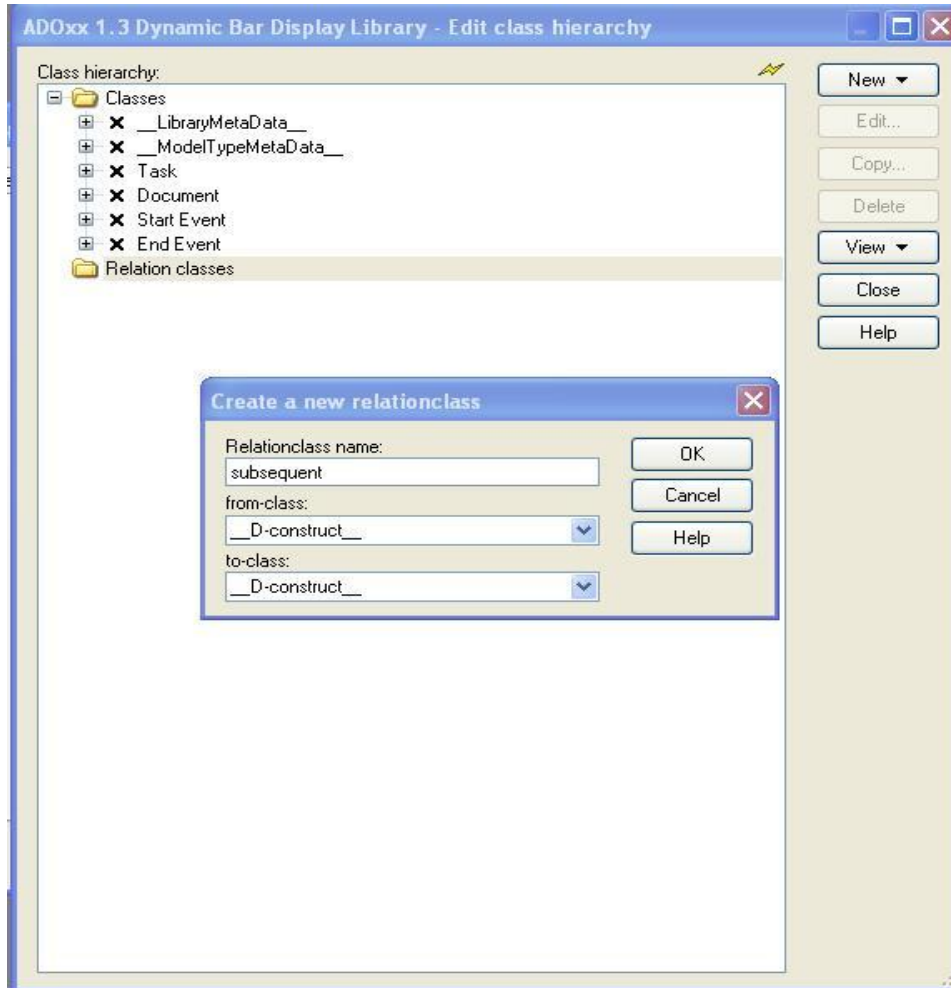


```
GRAPHREP
#-- GRAPHREP
#-- COLOR DEFINITIONS --
SET colBrd: (rgbval("$888800"))
SET colFFm: (rgbval("white"))
SET colFTo: (rgbval("$eeee00"))

CLIP_ELLIPSE rx:.7cm ry:.7cm
GRADIENT_RECT x:-0.9cm y:-.7cm w:2.8cm
             h:1.4cm style:downdiag
             color1:(colFFm) color2:(colFTo)
CLIP_OFF
PEN w:0.15cm color:(colBrd)
ELLIPSE rx:.7cm ry:.7cm
```




Create new relation class *subsequent*; superclass: from class `__D-Construct__` to class `__D-Construct` and Configure GraphRep



- Create Class *End*
- Go to class *End*.
- Double click *GraphRep (Metamodel)*.
- Click the *Dialog* button.
- Enter:

GRAPHREP rounded:0.1cm

SHADOW off

START

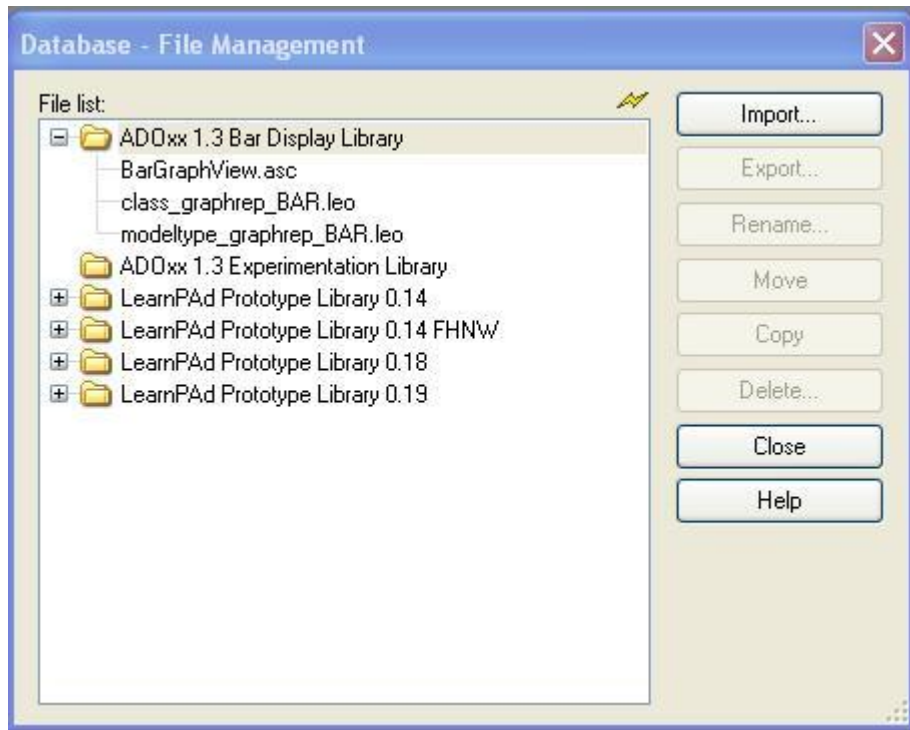
MIDDLE

END

FILL color:black

*POLYGON 3 x1:-.33cm y1:-.11cm x2:0.0cm
y2:0.0cm x3:-.33cm y3:0.11cm*

Import file *BarGraphView.asc*



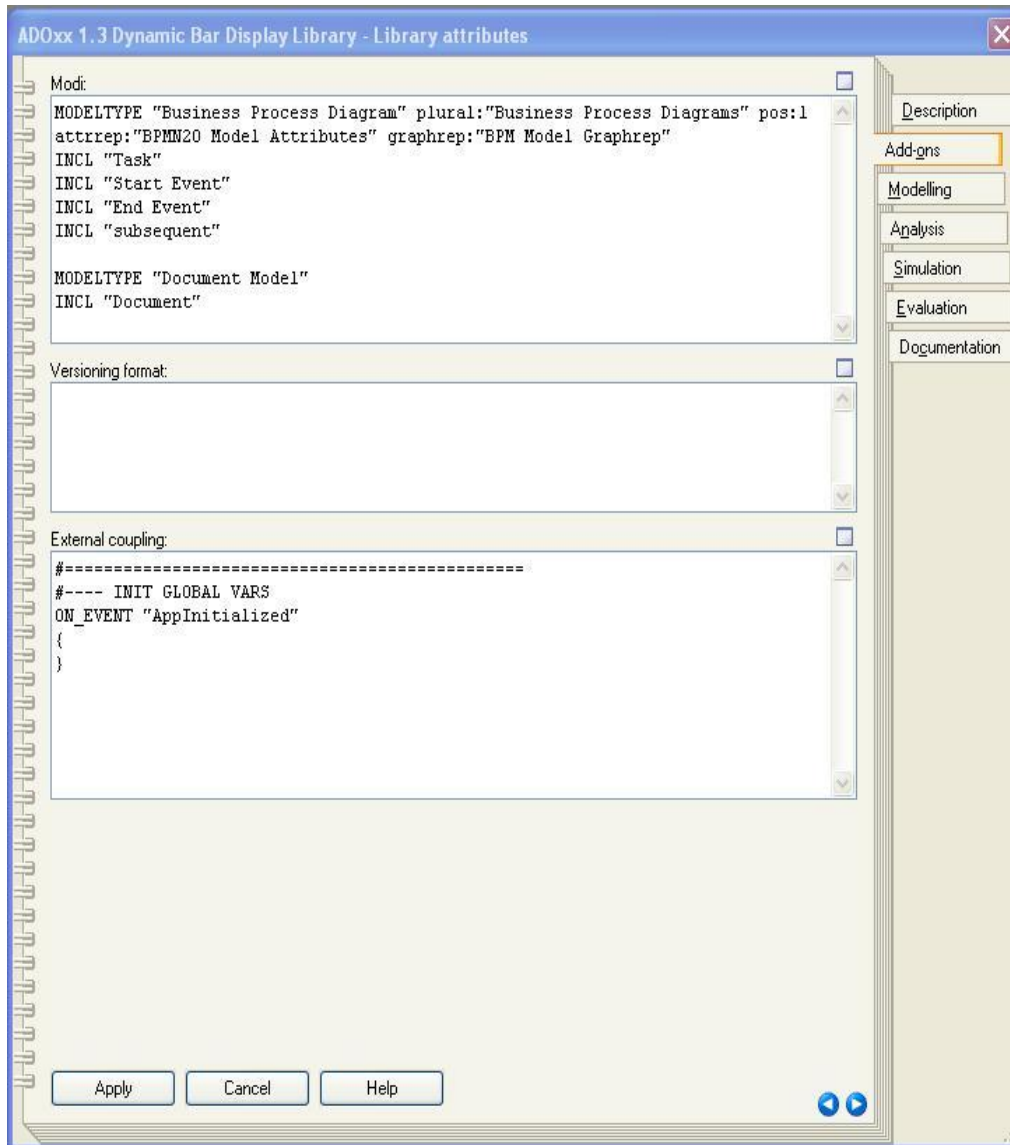
- Go to menu option *Extras* and then suboption *File management* in the development environment
- Import a file *BarGraphView.asc* after having entered the code and saving it as a file with this filename
- The code for this file is shown on the next slide

Code for file *BarGraphView.asc*



```
#####  
# Check if a model is open, and that it is the correct type  
#####  
  
CC "Modeling" GET_ACT_MODEL  
SET nModelID:(modelid)  
IF (nModelID = -1) {  
    CC "AdoScript" ERRORBOX "Error: No model currently open"  
    EXIT  
}  
  
CC "Core" GET_MODEL_MODELTYPE modelid:(nModelID)  
  
SET sModelType:(modeltype)  
IF (sModelType != "Business Process Diagram") {  
    CC "AdoScript" ERRORBOX "Error: Current model is not the correct modeltype \n Requires modeltype: Business Process Diagram"  
    EXIT  
}  
  
CC "Core" GET_ATTR_VAL objid:(nModelID) attrname:"BAR Display active"  
SET sDisplayActive:(val)  
  
IF (sDisplayActive = "No") {  
    CC "Core" SET_ATTR_VAL objid:(nModelID) attrname:"BAR Display active" val:"Yes"  
}  
ELSE {  
    CC "Core" SET_ATTR_VAL objid:(nModelID) attrname:"BAR Display active" val:"No"  
}  
}
```

Defining Modeltypes



Modeltypes:

- Go back to the *Library management* and select your current *Dynamic Library*.

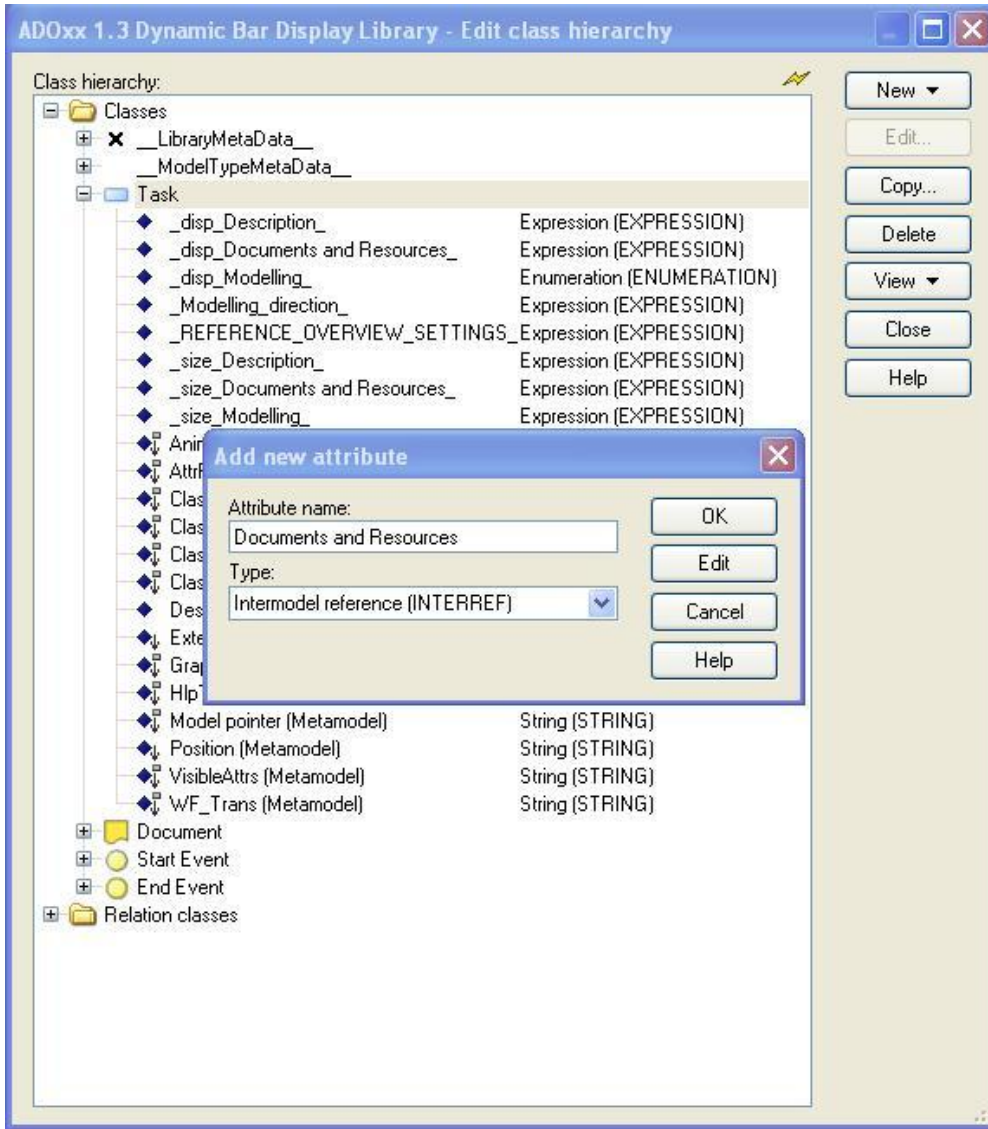
- Click *Library attributes...* → *Add-ons* and define the following two model types according the figure on the left-hand-side:

```
MODELTYPE "Business Process Diagram"  
plural:"Business Process Diagrams"  
pos:1 attrrep:"BPMN20 Model  
Attributes" graphrep:"BPM Model Graphrep"  
INCL "Task"  
INCL "Start Event"  
INCL "End Event"  
INCL "subsequent"
```

```
MODELTYPE "Document Model"  
INCL "Document"
```

- Click *Apply*.

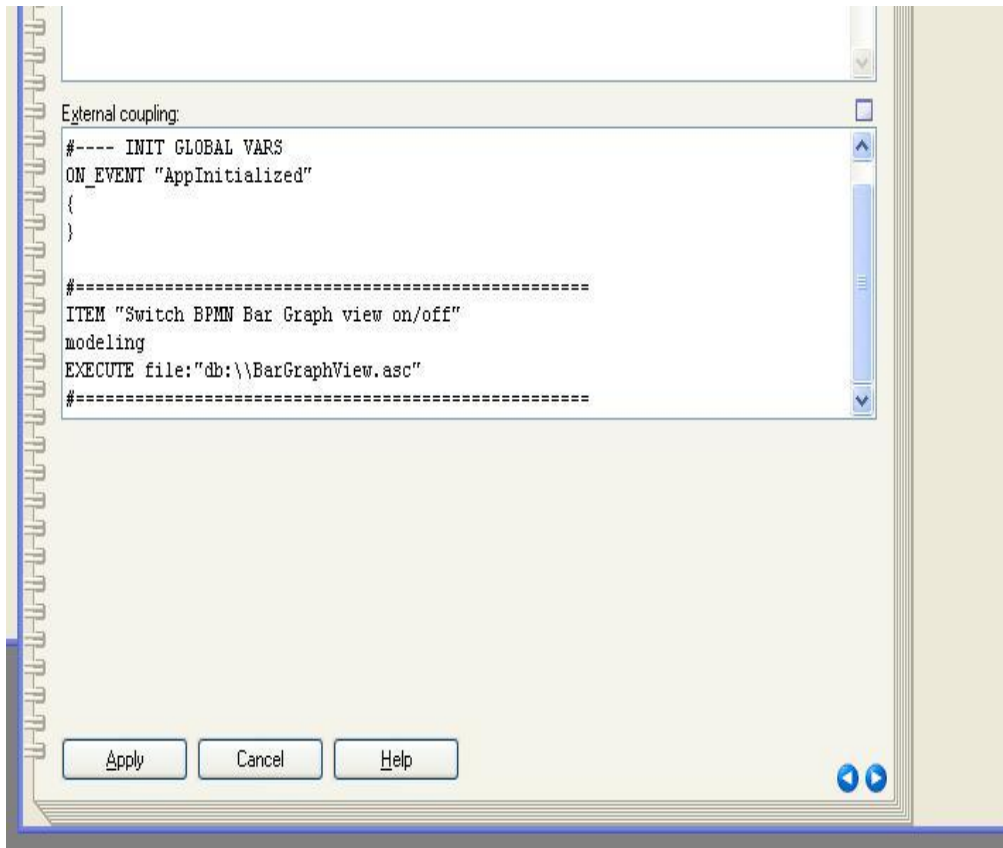
Configure *Interref* attribute *Documents and Resources* for class *Task*



Add *Interref* attribute:

- Select class *Task*
- Click *New* → *New attribute...*
- Name new attribute *Documents and Resources* and set type to *Interref*.
- Click *OK*
- Double click on new attribute *Documents and Resources* → click *Facets*.
- Click the *Dialog* button of the *AttributeInterRefDomain* attribute, see figure on the left.
- Select *Instance references*, click *Add...*, select Model type *Documents Model* and Class *Document* and apply (twice), see figure on the left.

Add menu item to activate/deactivate Bar Display View



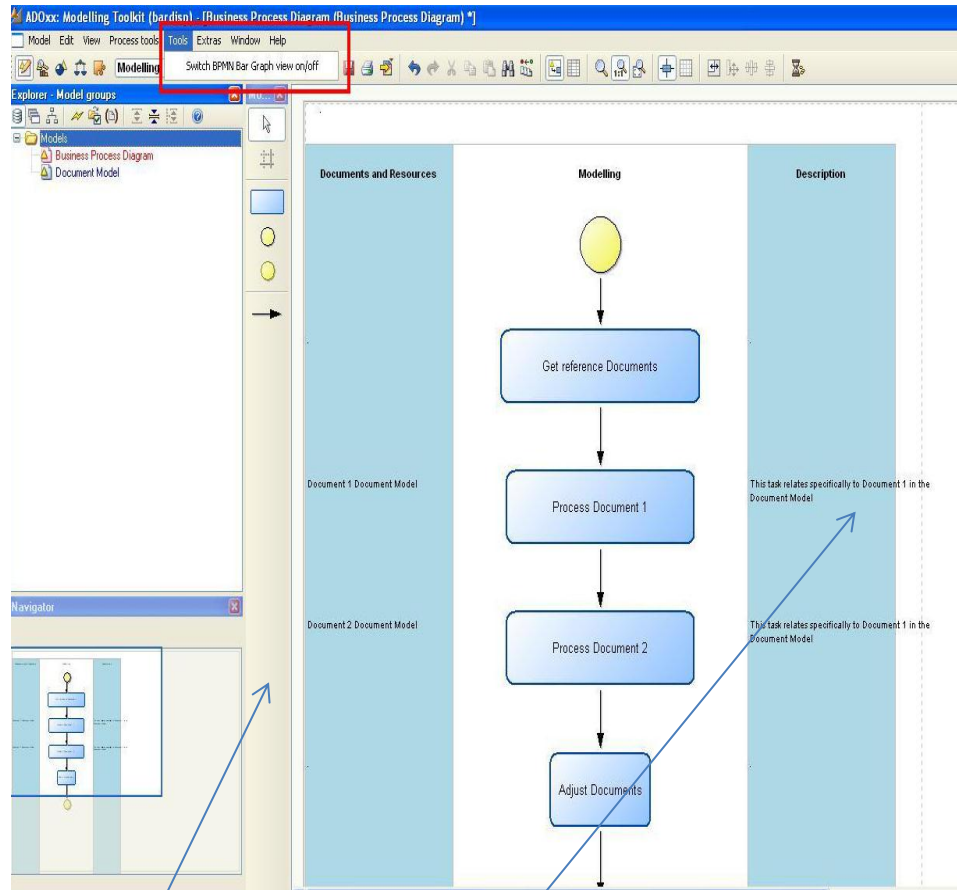
Add *Interref* attribute:

- Go back to the *Library management* and select your current *Dynamic Library*.
- Click *Library attributes...* --> *Add-ons* and then *External coupling*
- Add the following code to this

```
ITEM "Switch BPMN Bar Graph view on/off"
modeling
EXECUTE file:"db:\\BarGraphView.asc"
```

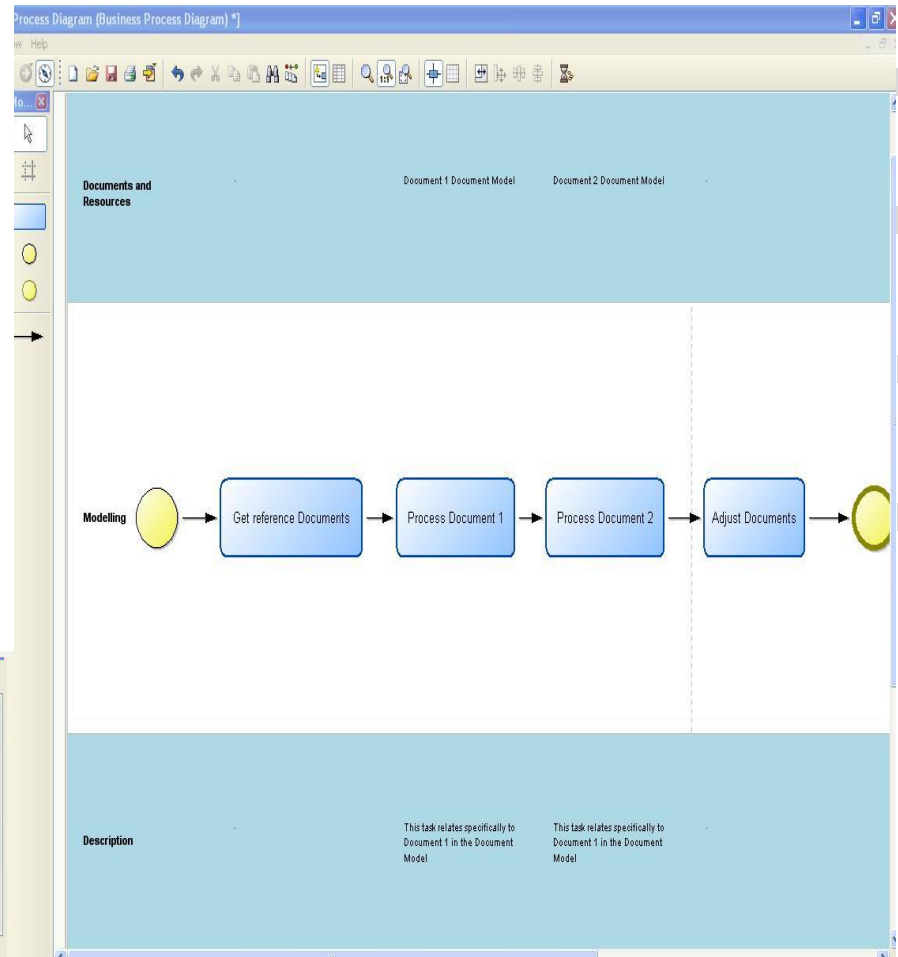
- Click *Apply*

Result: BAR GraphRep (model type) & GraphRep (class)



Horizontal view

Vertical view



Content of Task's Documents and Resources attribute (Longstring)

Content of Description attribute (class __ModelTypeMetaData__)

Result: going to model type notebook.

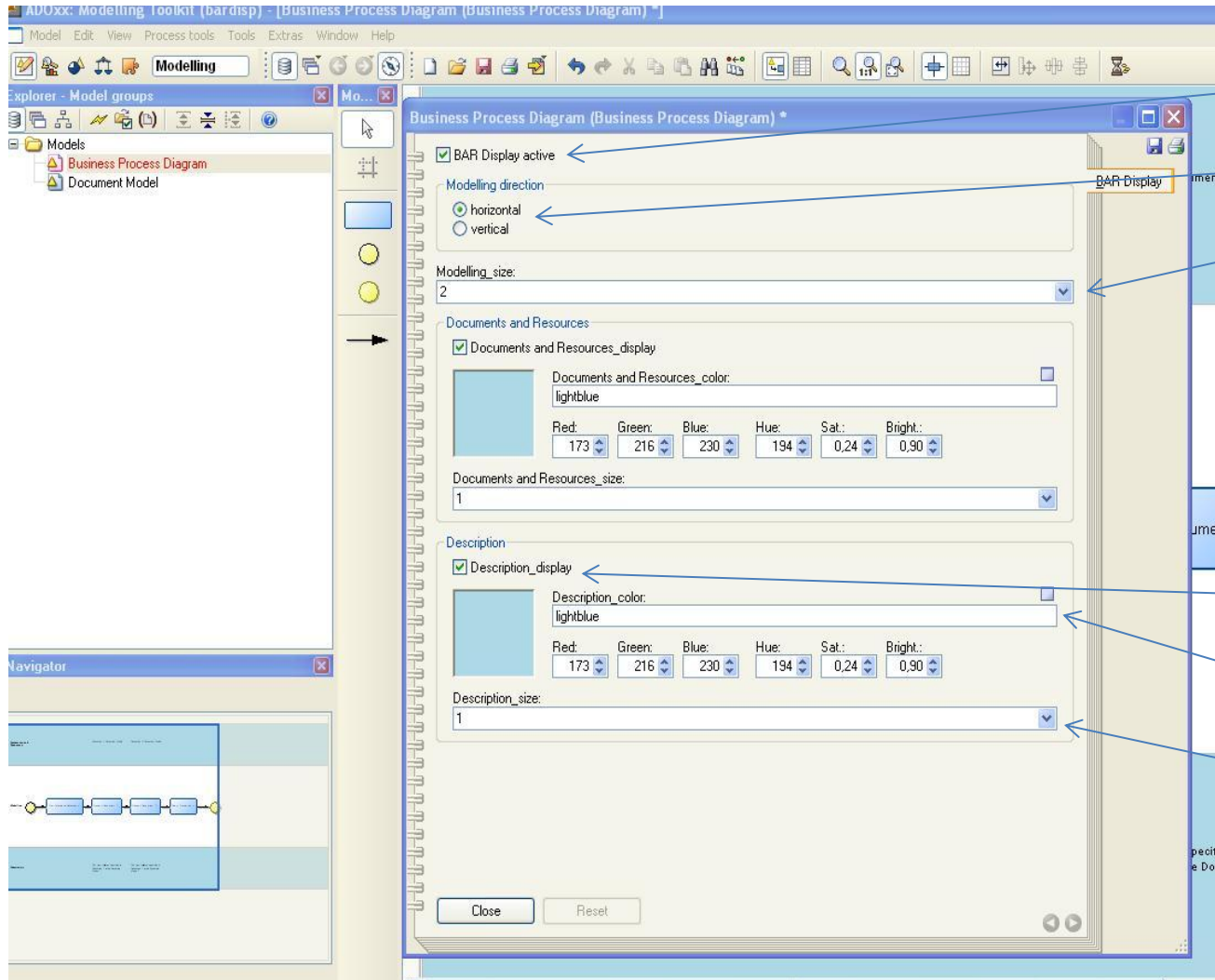


The screenshot displays the ADOxx Modelling Toolkit interface. The main window shows a Business Process Diagram (BPD) with a flow starting from a yellow circle, followed by tasks: 'Get reference Documents', 'Process Document 1', 'Process Document 2', and 'Adjust Documents', ending at another yellow circle. The diagram is divided into three panels: 'Documents and Resources', 'Modelling', and 'Description'. The 'Description' panel contains text: 'This task relates specifically to Document 1 in the Document Model'.

An inset window shows the 'Business Process Diagram (Business Process Diagram) *' properties notebook. It includes sections for 'Documents and Resources' and 'Description'. The 'Documents and Resources' section has a 'Documents_and_Resources_display' dropdown set to 'lightblue' and a 'Documents_and_Resources_size' dropdown set to '1'. The 'Description' section has a 'Description_display' dropdown set to 'lightblue' and a 'Description_size' dropdown set to '1'. A blue arrow points from a text box to the 'Description' section of the notebook.

Right click on modelling area and click *Model attributes* – or alternatively press Alt+Enter – in order to open the *Bar* notebook.

Result: Bar notebook, c.f. BAR AttrRep.



Switch Bar display on/off

Change direction of view

Select drawing area size

Switch single Bar on/off

Select color of Bar

Select Bar size



Further Questions?



www.adoxx.org

tutorial@adoxx.org

