

Analysis of Structural Similarities

SCENARIO: IMPLEMENTING AN ALGORITHM

Scenario Description

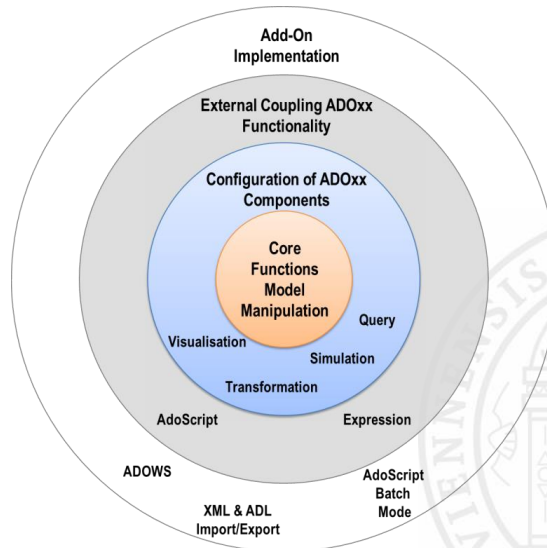
Case:

An algorithm for analysing structural similarities is implemented that queries business process models and creates a comparison matrix listing structural similarities.

GOAL:

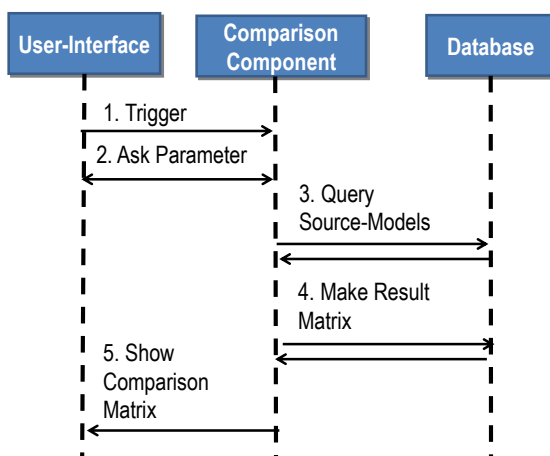
Demonstrate how models can be queried with AQL and ADOscripts, as well as indicate how to create and manipulate a model.

ADOxx Functionality on Meta Level



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Description of Algorithm

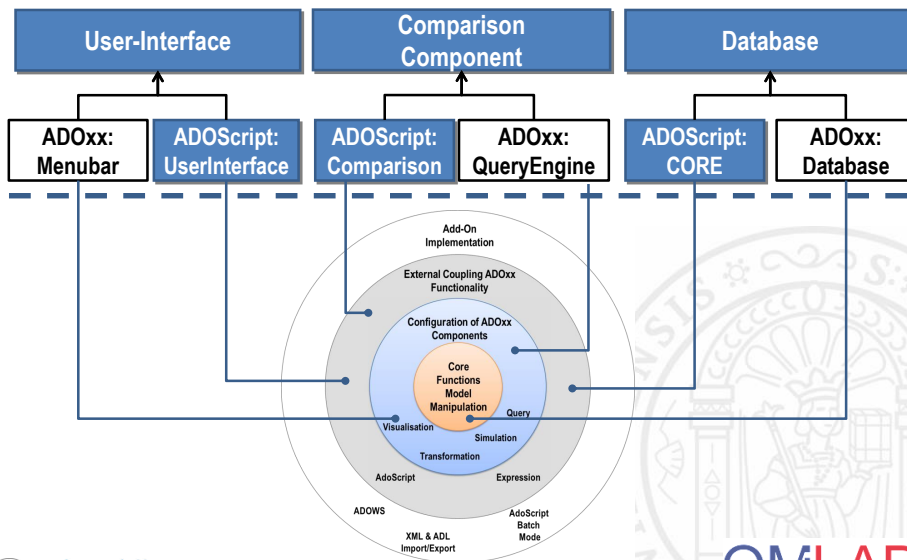


Additional Aspects:

- Implementation as plug-In to be used in other modelling languages.
- Comparison queries should be adaptable but start with comparing used objects.
- Migration from modelling language without plug-In to modelling language with plug-In has to be considered.

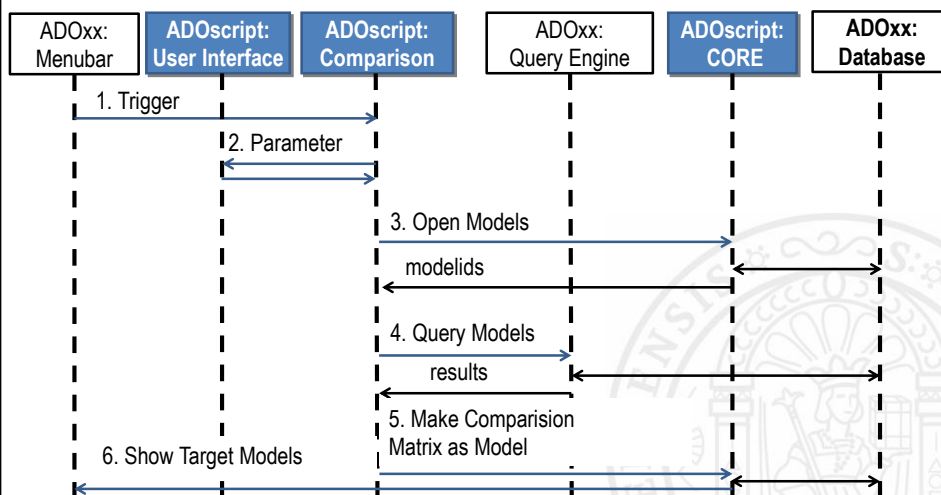
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Mapping ADOxx Functionality

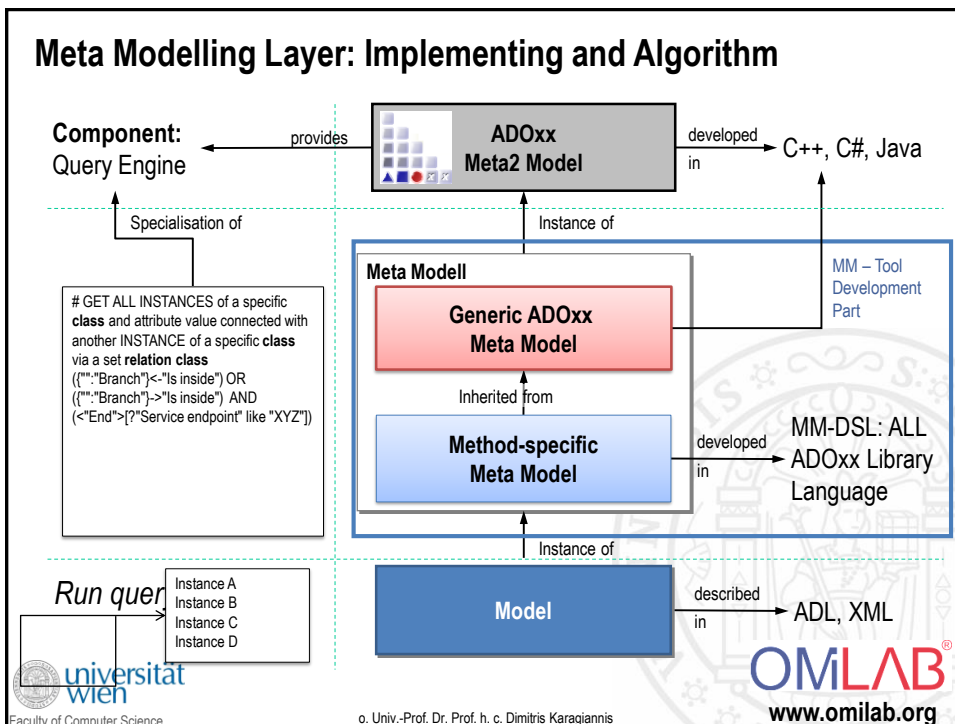


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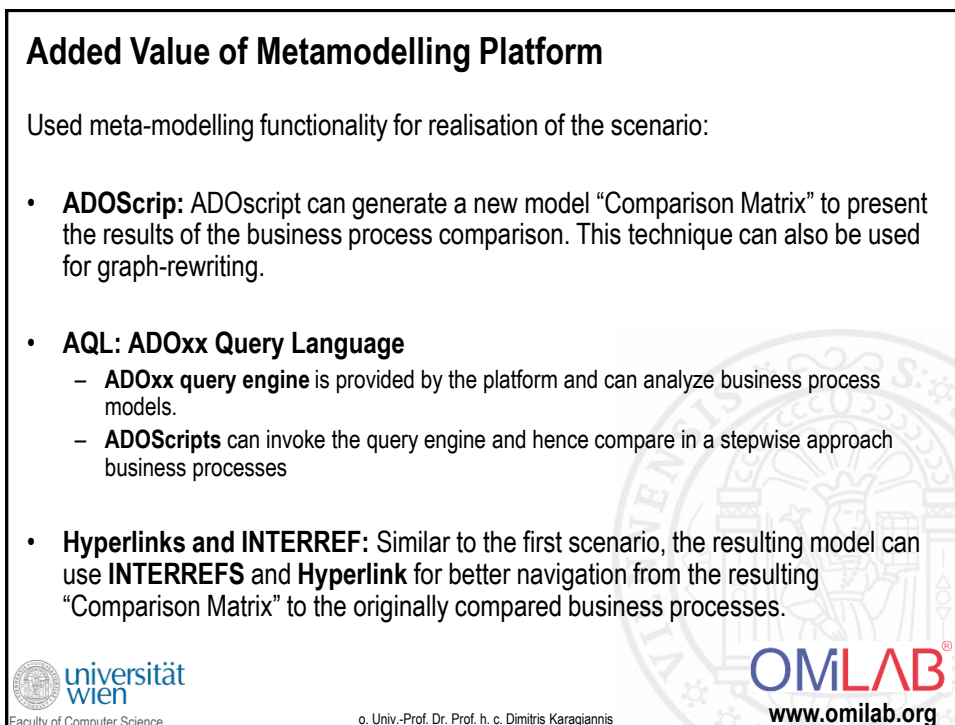
ADOxx Realisation Approach



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ADOxx Realisation Hands-On

1. Modelling Language Extensions to enable this algorithms

1. New model type "Comparison Model"
2. New class "Box", "Row Name" for Comparison Matrix Element





2. Configure ADOxx

1. Configure Menubar
2. Write AQL statements for query engine

3. Implement Algorithm with ADOscript

1. ADOscript User Interface
2. Invoking query engine with ADOscript
3. Create target model "Comparison Matrix and place matrix elements according to the results of the query.

Used ADOxx Functionality: Implementing an Algorithm

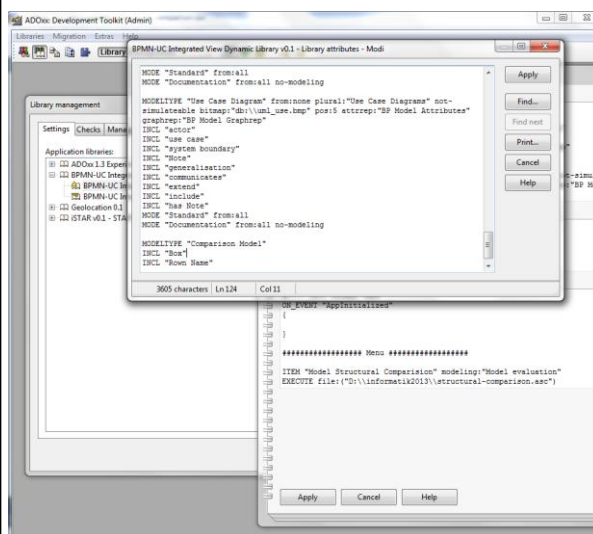
| | |
|-------------------------------------|--|
| Introduction | Mechanisms & Algorithms Implementation |
| Setup of Implementation Environment | Core Functions for Model Manipulation |
| Modelling Language Implementation | Database |
| Classes | Visualisation |
| Relations | Query  |
| Class Attributes and Attributes | Transformation |
| GRAPHREP | Configuration of ADOxx Components |
| ATTRREP | Visualisation |
| CLASS Cardinality | Query |
| CONVERSION | External Coupling ADOxx Functionality  |
| Model Pointer | ADOscript Triggers  |
| Attribute Facets | ADOscript Language Constructs |
| Model Types | Visualisation ADOscript |
| | Visualisation Expression |
| | Query ADOscript  |
| | Transformation ADOscript |
| | ADD-ON Implementation |
| | ADOxx Web-Service |
| | XML / ADL Import – Export |
| | ADOscriptBatch Mode |

HANDS-ON

Analysis of Structural Similarities

2. SCENARIO: IMPLEMENTING AN ALGORITHM

Define new Modeltype „Comparison Matrix“

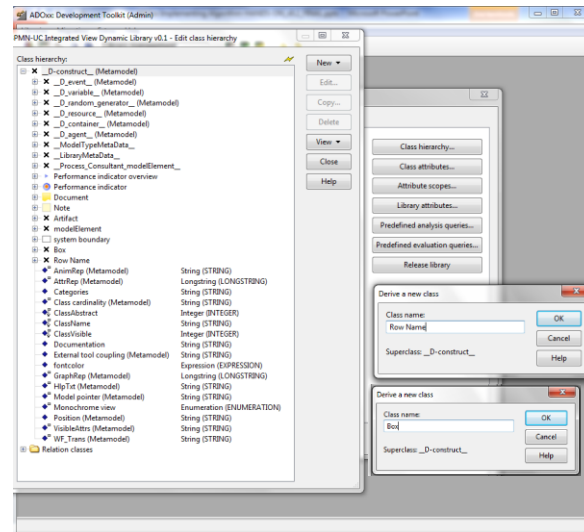


New Modeltype:

- Select “BPMN-UC Integrated View Dynamic Library” and open Library attributes.
- Got to Add Ons
- Add the Modeltype “Comparison Matrix” in the Modi attribute
- When the classes are defined, you need to INCLUDE “Box” and “Row name”

MODELTYPE "Comparison Model"
INCL Box
INCL Row name

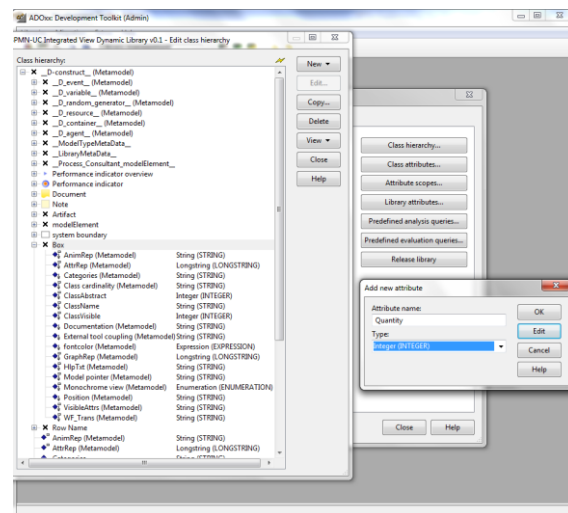
Make New Modeltype



New Modeltype:

- Select "BPMN-UC Integrated View Dynamic Library" and open Library attributes.
- Open Class hierarchy, view "Metamodel" and "Class hierarchy" in the View button, select `_D-construct_` and click new class.
- Name new classes: "Box" and "Row Name"
- Box and Row Name are now sub-classes of `_D-construct_`

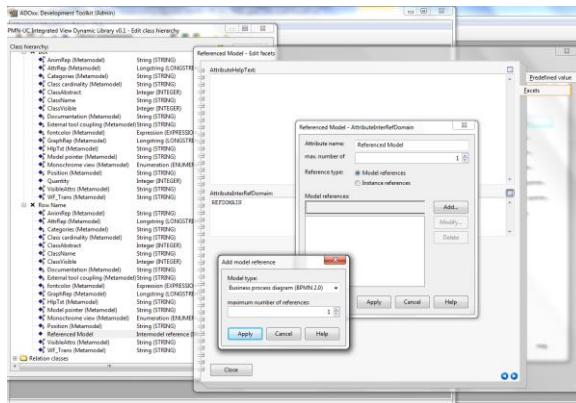
Add Attributes for Classes „Box“ and „Row Name“



Add Attributes

- Select "Box" and click New, attribute.
- Make "Quantity" as type INTEGER.
- Select "Row Name" and click New, attribute.
- Make "Referenced model" an INTERREF to target modeltype "BPMN"
- Make "Row name" a STRING.

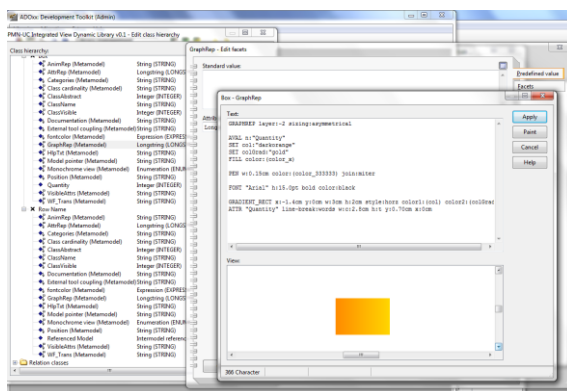
Edit INTERREF



Specification of INTERREF

- EDIT Facet
- Select AttributeInterrefDomain
- Select "Model reference"
- Max number of references is 1
- Select Business Process Diagram
- Max number of references is 1

Add GRAPHREP



Specification of GRAPHREP

- Select "Box"
- Click on Attribute "GraphRep"
- Open the GraphRep Editor
- Enter text, paint it and apply.

GRAPHREP layer:-2 sizing:asymmetrical
 AVAL n:"Quantity"
 SET col:"darkorange"
 SET colGrad:"gold"
 FILL color:(color_x)
 PEN w:0.15cm color:(color_333333) join:miter
 FONT "Arial" h:15.Opt bold color:black
 GRADIENT_RECT x:-1.4cm y:0cm w:3cm h:2cm style:horz color1:(col) color2:(colGrad)
 ATTR "Quantity" line-break:words w:c:2.8cm h:t y:0.70cm x:0cm

GRAPHREP

```
GRAPHREP layer:-2 sizing:asymmetrical

AVAL n:"Quantity"
SET col:"darkorange"
SET colGrad:"gold,"

FILL color:(color_x)

PEN w:0.15cm color:(color_333333) join:miter
FONT "Arial" h:15.0pt bold color:black

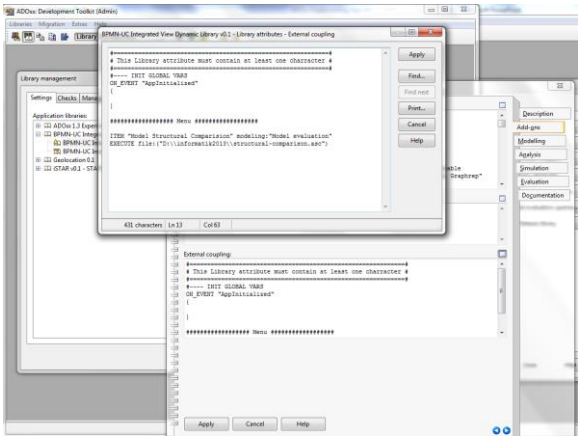
GRADIENT_RECT x:-1.4cm y:0cm w:3cm h:2cm style:horz color1:(col) color2:(colGrad)
ATTR "Quantity" line-break:words w:c:2.8cm h:t y:0.70cm x:0cm

GRAPHREP
FONT "Arial" h:10pt bold color:black

AVAL reference:"Referenced model"
AVAL rowname:"Row name"

IF(LEN reference > 0)
  ATTR "Referenced model" line-break:words x:-1.4cm y:0.75cm w:c:2.8cm h:c:1.5cm format:"%m"
ELSIF (LEN rowname > 0)
  ATTR "Row name" line-break:words x:-1.4cm y:0.75cm w:c:2.8cm h:c:1.4cm
ELSE
  ATTR "Name" line-break:words x:-1.4cm y:0.75cm w:c:2.8cm h:c:1.4cm
ENDIF
```

Add Menubar



Add Menubar

- Select Dynamic Library.
- Open Library Attributes
- Select Add-On
- Open External Coupling
- Add Menubar in External Coupling

Menu

ITEM "Model Structural Comparison" **modeling**:"Model evaluation"
EXECUTE file:("D:\informatik2013\structural-comparison.asc")

Copy and Configure ADOscript

```
#####
# Structural Comparision          #
#####

#-----
# Parameter setup
#-----

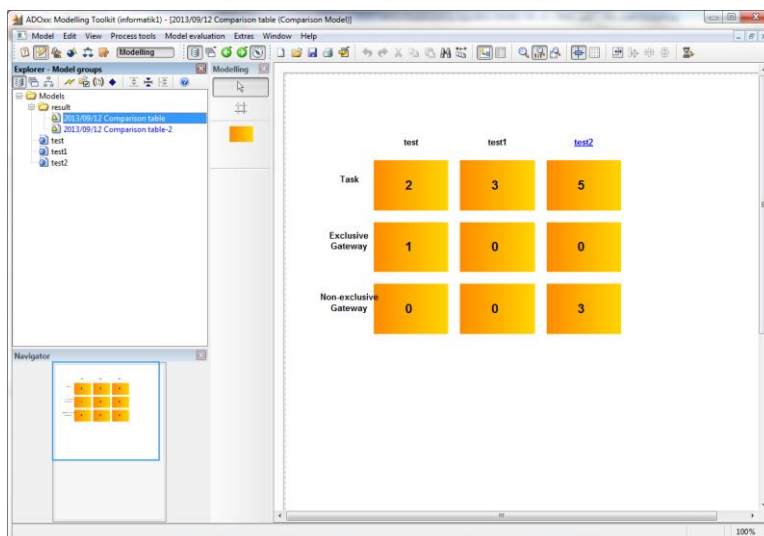
SETL strtkn_element:"Task,Exclusive Gateway,Non-exclusive Gateway,X"
SETL aqltkn_statements:"(<\\"Task\\">)&@(<\\"Exclusive Gateway\\">)&@(<\\"Non-exclusive Gateway\\">)"
SETL int_cnt_elements:(tokcnt((strtkn_element),","))

SETL str_modeltype-1:"Business process diagram (BPMN 2.0)"
SETL str_modeltype_name:"Comparison Model"

#-----
# Source Model and Target Model selection
#-----

...
```

Result



Thank you for your attention!

In case of any questions, please contact

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