

LMDQL – Link-based and Multidimensional Query Language

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Introduction

- ▶ XML
 - Heterogeneity
 - Semantic
 - Syntactic
 - Structural
- ▶ XML Schema
- ▶ XLink
- ▶ Data Warehouse (DW) for XML Data
- ▶ OLAP for XML Data
- ▶ XLink for representing XML Data
- ▶ LMDQL Requirements

XLDM

- ▶ XLink Based Data Metamodel
- ▶ Formalization
- ▶ Changes made based on XBRL Dimensions
 - Additions
 - Removals
 - Modified files
 - Instance Schema
 - Linkbase Schema

XPath+

► Syntax

<code>/***</code>	Selects arcs among all the instance elements
<code>/<code><element></code>**</code>	Selects all the arcs of an element
<code>///</code>	Selects arcs which the destination is the context node
<code>link-destination::</code>	
<code>...</code>	Selects arcs which the source is the context node
<code>link-source::</code>	
<code>[[x]]</code>	Selects the x-th element of a node list

LMDQL

- ▶ Query Statement

(\$VARIABLE variable_specification)?

(WITH formula_specification)?

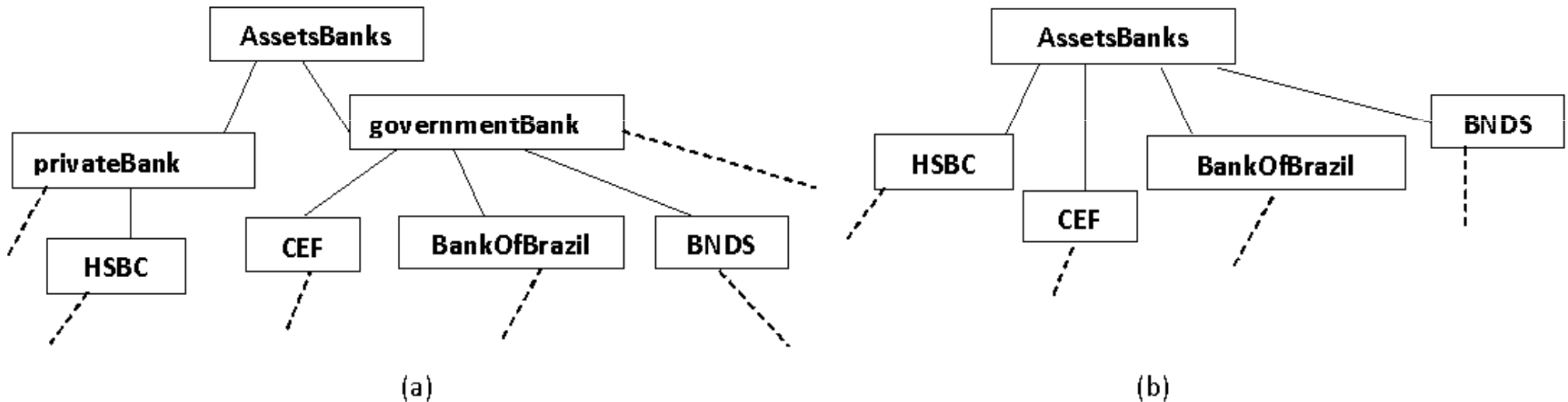
SELECT axis_specification_list

FROM cube_specification

(WHERE slice_specification)?

(CELL PROPERTIES cell_props)?

LMDQL

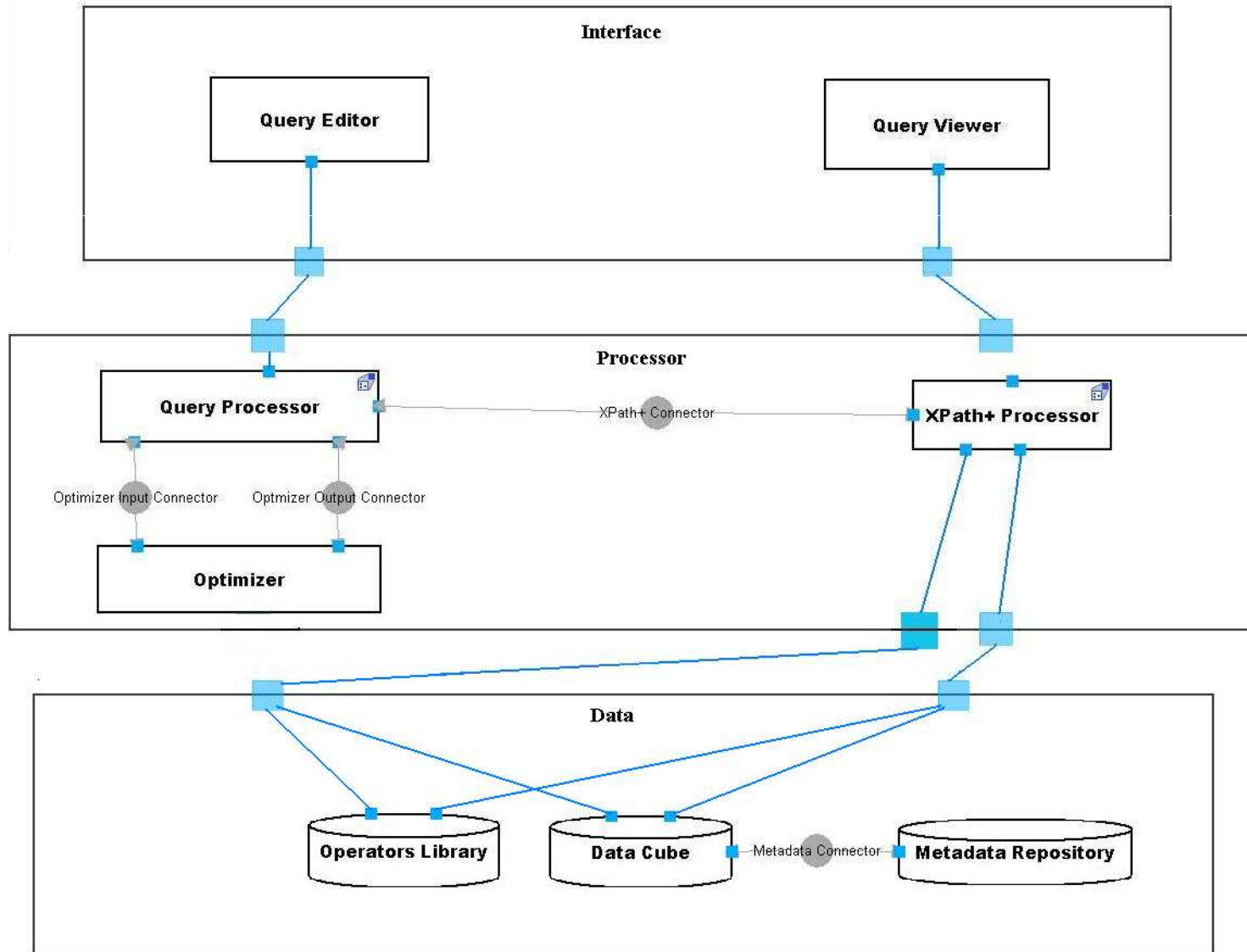


```
$VARIABLE [e] = [assetsBanks] |  
               [assetsBanks].[privateBank] |  
               [assetsBanks].[governmentBank]  
WITH MEMBER [Measure].[totalAssets] AS 'SUM ([e].Members)'  
SELECT {[Measure].[totalAssets] ON Axis(0)}  
FROM FinancialCube
```

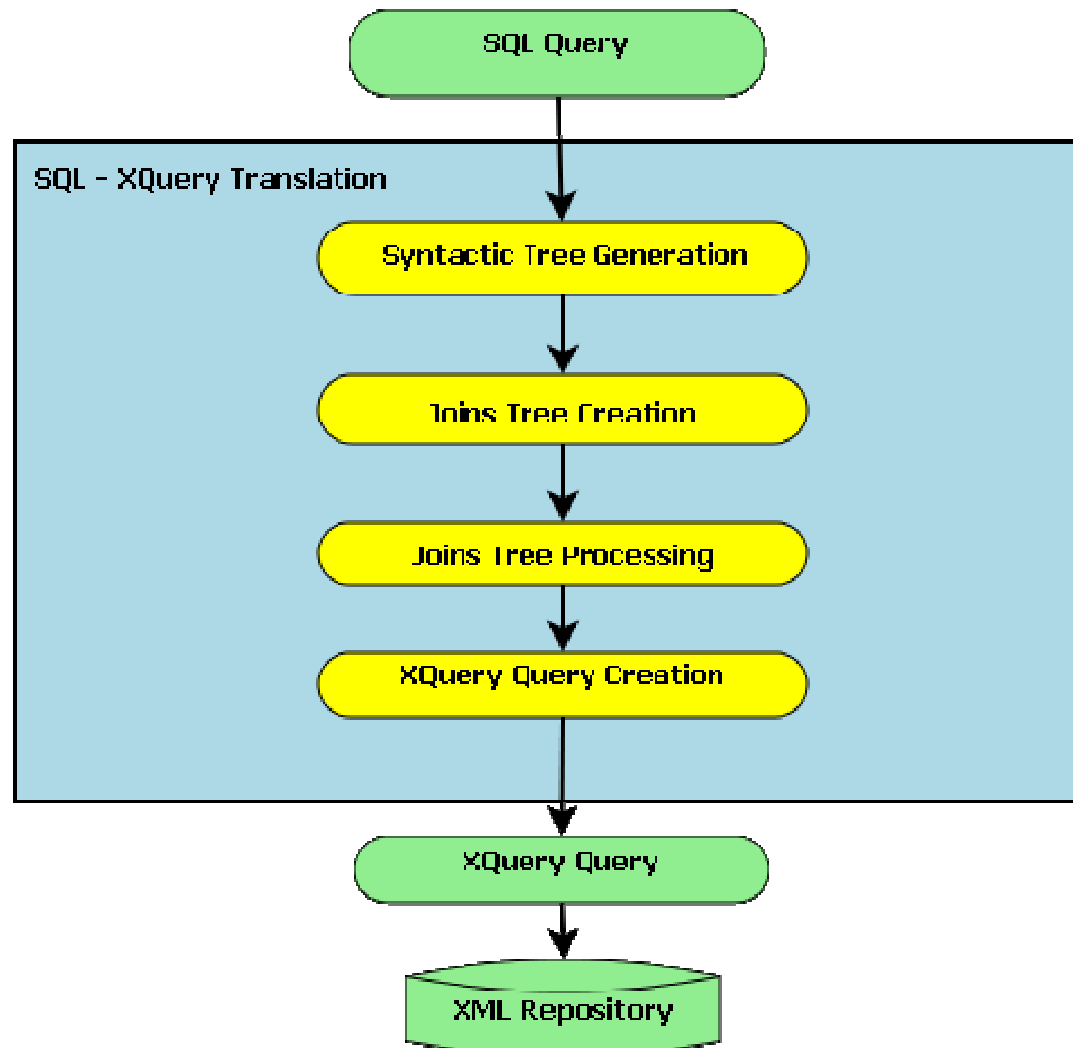
LMDQL Operators

- ▶ *OperatorDefinition*
- ▶ *HAnalysis*
- ▶ *VAnalysis*
- ▶ *Separatrix*
- ▶ *Cross*
- ▶ *NNearestValues*

LMDQL Processor Architecture



LMDQL Implementation Aspects



Conclusion

- ▶ Multidimensional queries in XML documents that make use of XLink
- ▶ Creation of operator libraries for specific domains
- ▶ Concise queries
- ▶ Implementation possible in OLAP servers based on MDX and SQL – driver *jdbc4dwXmlXlink*