

and the user interface is Web-based, which makes it easier to interchange metadata among different OLAP products. Users can experience the different analysis environments of different products without the need to learn the complex cube creation process for each product. By extending this research to design a common query language that can be used among OLAP products, OLAP products should be able to more easily talk to one another.

Key words : OLAP, metadata, interchange, XML

1.

가

(On-Line Analytical Processing: OLAP) 가

[1]. OLAP 가

OLAP , OLAP

OLAP . OLAP

OLAP API

OLAP MD-API OLE DB FOR OLAP API가

[2]. OLAP OLAP 가

OLAP XML OLAP OLAP

OLAP OLAP

OLAP OLAP

OLAP OLAP

OLAP OLAP

가

가 OLAP

OLAP

[3,4].

XML OLAP OLAP 가

가 cube, attribute, dimension, hierarchy

XML

가 OLAP

OLAP

가 MD-API OLE DB

FOR OLAP API 가

. 2 OLAP

. 3 OLAP OLAP

4 3 OLAP OLAP

OLAP

5

2.

OLAP

2.1. OLAP

OLAP OLAP

40 OLAP

OLAP , , 가

OLAP OLAP OLAP

OLAP

API . OLAP MD-API OLE DB FOR

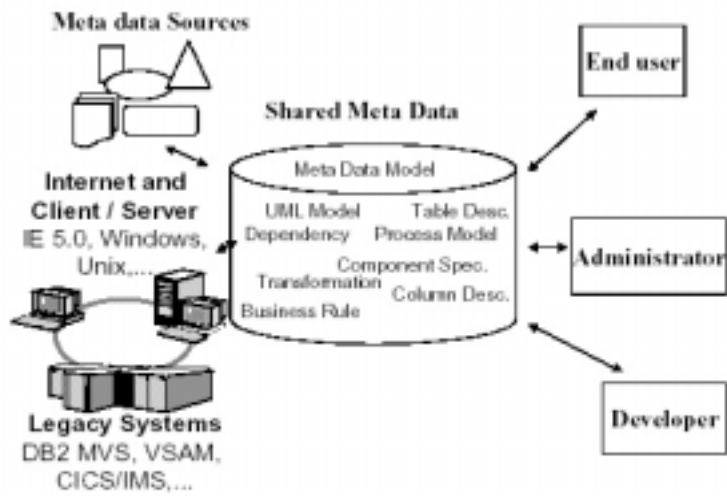
OLAP API가 [5,6].

- MD-API (OLAP Council) : MD-API OLAP API 가

가 OLAP
 OLAP
 API ,
 가 [5].
 • OLE DB FOR OLAP API (Microsoft) : OLE DB FOR OLAP API
 API 가 OLE DB
 API
 COM OLAP
 , OLAP
 MDX (Multidimensional Expressions)
 SQL [6].

3. OLAP

OLAP 가
 OLAP [7].
 (1).
 가 , (MetaData Coalition) (Open
 Information Model) (Object Management Group)
 (Common Ware house Metamodel) [8,9,10,11].



(1)

3.1. XML OLAP

3.1.1.

XML OLAP .
 XML [12,13]. XML W3C(World Wide
 Web Consortium)
 API XML API
 XML
 DTD, XML Schema
 OLAP
 OLAP
 가
 [16]. Attribute
 OLAP
 Attribute
 OLAP

MEASURE, HIERARCHY, LEVEL, MEMBER, ATTRIBUTE
 DATABASE, CUBE, DIMENSION,
 (2)
 가 DATABASE DTD

```
<!ELEMENT OLAPDATABASE (PROPERTY, DATASOURCE*, CUBE+)>
<!ATTLIST OLAPDATABASE
  database_name CDATA #REQUIRED
  created_on CDATA #IMPLIED
  last_schema_update CDATA #IMPLIED
  schema_updated_by CDATA #IMPLIED
>
```

(2) OLAP -

OLAPDATABASE PROPERTY, DATASOURCE CUBE . OLAP
 가 가 DATASOURCE
 가 .
 OLAPDATABASE CUBE .

CUBE PROPERTY, MEASURE DIMENSION STORE
 (3). CUBE PROPERTY 가

```
<!ELEMENT CUBE(PROPERTY, MEASURE+,DIMENSION+,STORE?)>
<!ATTLIST CUBE
  cube_name CDATA #REQUIRED
  created_on CDATA #IMPLIED
  last_schema_update CDATA #IMPLIED
  schema_updated_by CDATA #IMPLIED
>
<!ELEMENT PROPERTY(database_name+, cube_type, cube_desc*, cube_guid?,
is_virtual, is_drillthrough_enabled?, is_linkable?, is_SQL_enabled? )>
```

(3) OLAP -

(4) MEASURE

가 numeric_precision, numeric_units,
 numeric_scale . MEASURE
 measure_aggregator caption, unique_name . MEASURE FIELD
 DIMENSION

```

<!ELEMENT MEASURE(PROPERTY, FIELD+, DATATYPE)*>
<!ATTLIST MEASURE
  measure_name      CDATA #REQUIRED
  created_on        CDATA #IMPLIED
  last_schema_update CDATA #IMPLIED
  schema_updated_by CDATA #IMPLIED
>
<!ELEMENT PROPERTY(database_name+, cube_name, measure_unique_name?,
  Measure_caption?, measure_guid?, measure_desc*, measure_aggregator )>

```

(4) OLAP -

(5) DIMENSION HIERARCHY DATATYPE, ATTRIBUTE
 HIERARCHY HIERARCHY
 DATATYPE ATTRIBUTE ,
 . PROPERTY
 가
 가 . dimension_ordinal
 , dimension_cardinality
 . Dimension_type , ,

```

<!ELEMENT DIMENSION(PROPERTY, HIERARCHY*, DATATYPE?, ATTRIBUTE*)>
<!ATTLIST DIMENSION
  dimension_name      CDATA #REQUIRED
  created_on          CDATA #IMPLIED
  last_schema_update  CDATA #IMPLIED
  schema_updated_by   CDATA #IMPLIED
>
<!ELEMENT PROPERTY(database_name+, cube_name*, dimension_unique_name?,
  dimension_desc*, dimension_ordinal, dimension_type, dimension_cardinality,
  default_hierarchy, is_virtual, is_drillthrough_enabled?,
  dimension_unique_settings?, is_SQL_enabled? )>

```

(5) OLAP -

```

<!ELEMENT HIERARCHY(PROPERTY, LEVEL*, DATATYPE?, ATTRIBUTE*)>
<!ATTLIST HIERARCHY
  hierarchy_name      CDATA #REQUIRED
  created_on          CDATA #IMPLIED
  last_schema_update  CDATA #IMPLIED
  schema_updated_by   CDATA #IMPLIED
>

```

(6) OLAP -

HIERARCHY LEVEL ATTRIBUTE, DATATYPE 가

(6). XML DTD OLAP

가

3.1.2.

OLAP

OLAP

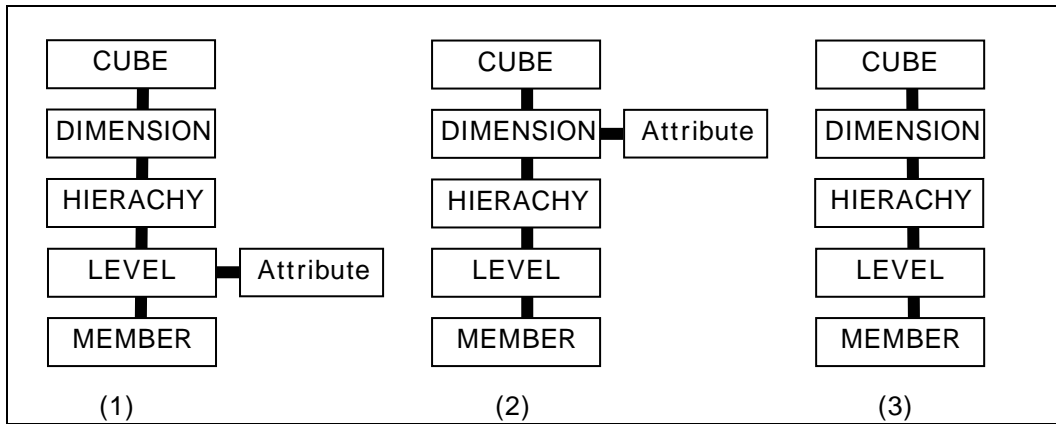
OLAP

, OLAP

< 1>

< 1> OLAP

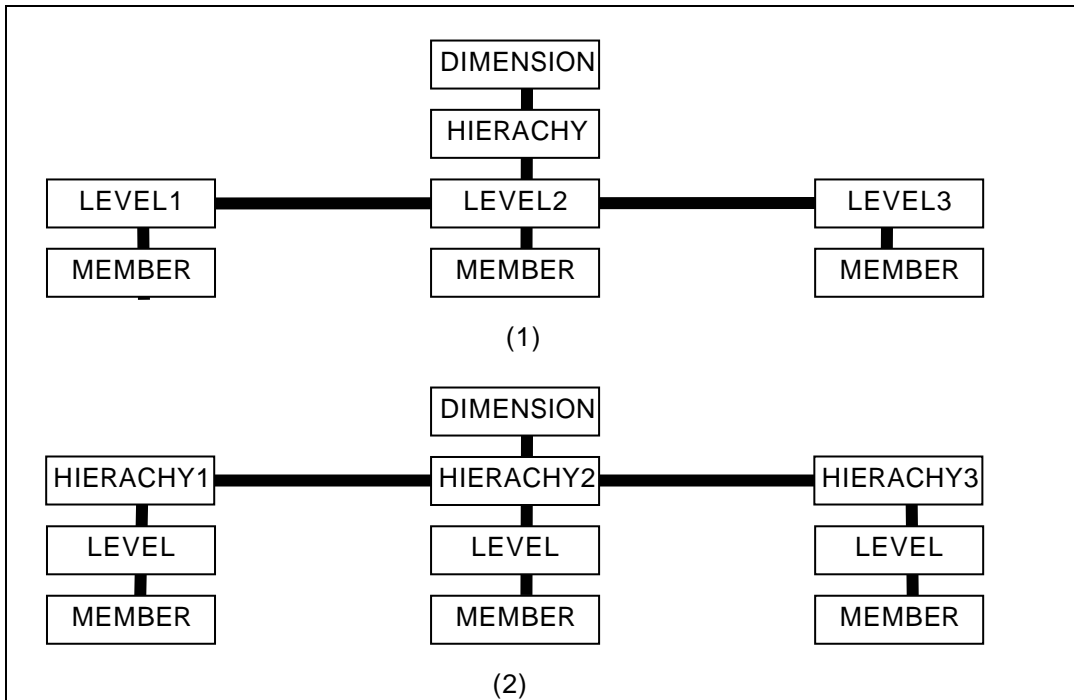
OLAP \ OLAP	Storage	Cube	Attribute	Dimension
Cognos Powerplay	MOLAP		Not Supported	Multi level (Special category)
Hyperion Essbase	MOLAP		Dimension attribute	Single Hierarchy Multi level
Informix Metacube	ROLAP		Supported	Single Hierarchy Multi level
MS OLAP Services	HOLAP		Level Attribute	Single Hierarchy Multi level
Oracle Express	MOLAP (HOLAP)		Not Supported	Multi Hierarchy Single level
Pilot DSS	MOLAP (HOLAP)		Dimension attribute	Single Hierarchy Multi level



(7) OLAP - Attribute

• Attribute

Attribute
Property ,
(7) OLAP
Attribute . Cognos
Powerplay Oracle Express (7) (3)
Informix Metacube MS OLAP Services, Pilot DSS
. OLAP Services (7) (1) (Level)
Attribute 가 . Attribute 가 ,
Attribute 가 . Attribute가
가 . Pilot DSS (7) (2)
Attribute .
Attribute .
Attribute Attribute 가 Attribute
, Attribute Attribute Attribute .



(8) OLAP - Dimension

• Dimension

(8) (1)

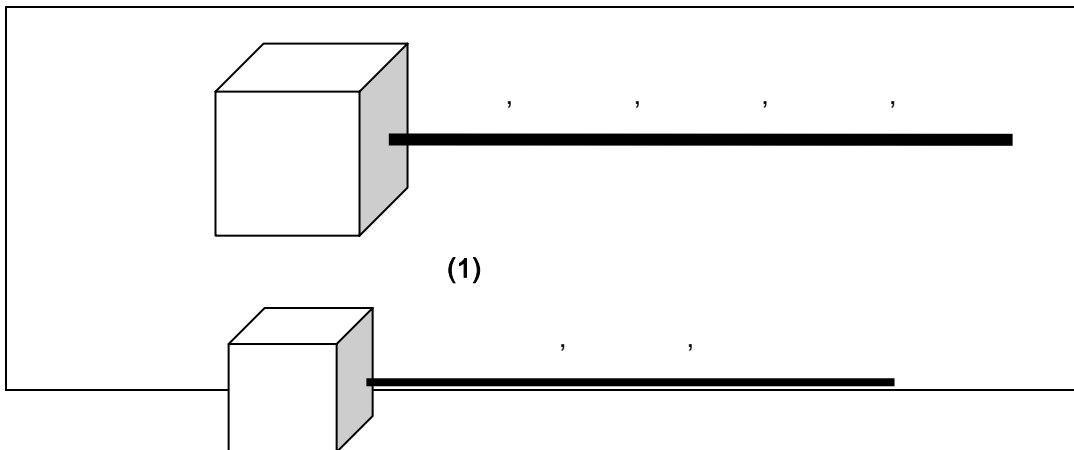
Oracle Express

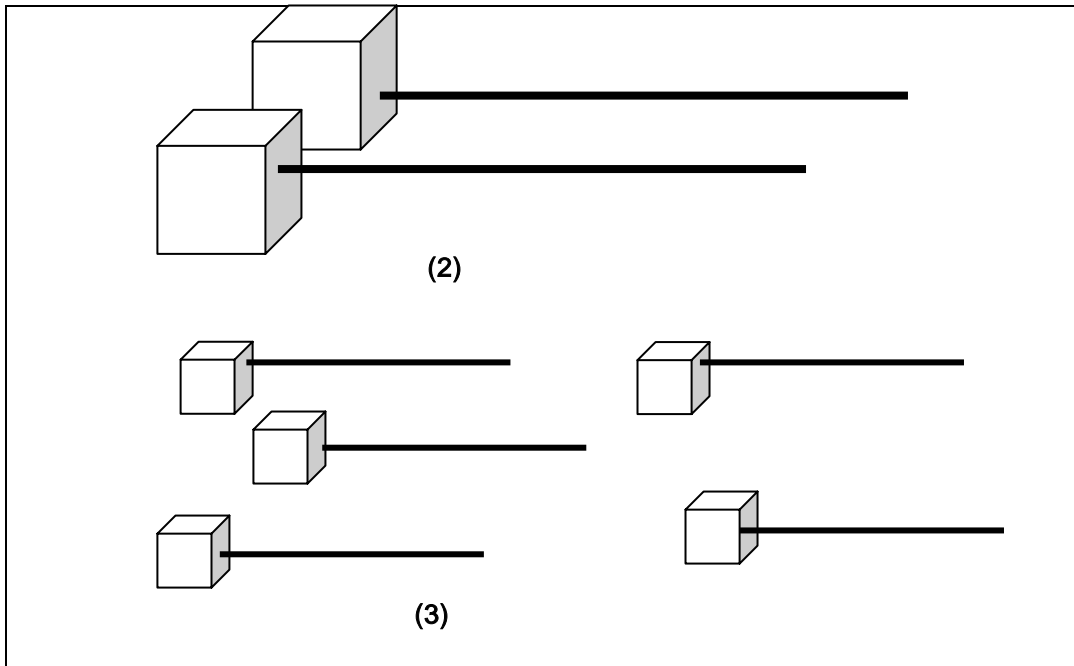
(8) (2)

가

Express

relation





(9) OLAP - Cube

• Cube

(Hypercube)

(Multicube)

(9)

가

Oracle Express null

OLAP

가

4.

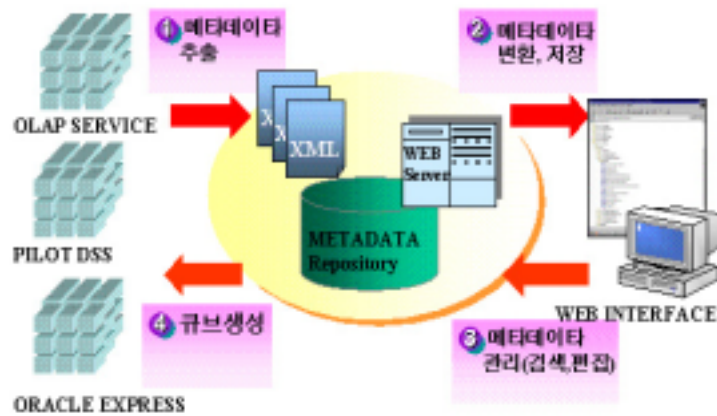
OLAP

4.1.

OLAP
OLAP
Object Design
XML
XML
Windows 2000 Server
XML
가 ,
가
OLE DB FOR OLAP API COM
C++
OLAP
Internet Information Server 4(IIS)
4) , XML Microsoft Explorer 5.0
ASP, XQL, XSL
가 OLAP Microsoft OLAP Services, Pilot DSS(Decision
Support Suit), Oracle Express

4.2.

OLAP
OLAP XML XML import
, XML
, OLAP XML
COM Client API Import ()
10)



(10)

가 OLAP

XML

OLAP

4.2.1.

OLAP

C++

OLE DB for

OLAP API

. OLE DB for OLAP API

OLAP

, OLAP

IDBSchema Rowset

가

Rowset

OLE DB 가

3

Enumerator Object, Data Source Object, Session Object가 CUBE rowset, DIMENSION rowset, HIERARCHIES rowset, LEVELS rowset, MEASURES rowset, MEMBERS rowset, PROPERTIES rowset

4.2.2.

XML

. XML

OLAP

XML COM Client API Import
 . (11) XML OLAP
 가 XML .
 Sales 가 가
 . ,
 가
 가 . dimension_ordinal
 , dimension_cardinality .
 , , 3 .
 가 ,
 XML .

```

<OLAPDATABASE database_name="business" > ...
<CUBE cube_name="sales" created_on="2001-04-27 7:10:55">
<PROPERTY>
<database_name>business</database_name>
<cube_type>cube</cube_type>
<cube_desc>business-sales</cube_desc>
<cube_guid>7658</cube_guid>
<is_virtual>False</is_virtual>
<is_drillthrough_enabled>False </is_drillthrough_enabled>
<is_linkable>True</is_linkable> <is_sql_enabled>True</is_sql_enabled>
</PROPERTY> ...
<DIMENSION dimension_name="customer" created_on="2001-05-01 5:20:15">
<PROPERTY>
<database_name>business</database_name> <cube_name>sales</cube_name>
<dimension_unique_name>[customers]</dimension_unique_name>
<dimension_desc>customer information</dimension_desc>
<dimension_ordinal>6</dimension_ordinal>
<dimension_type>3</dimension_type>
<dimension_cardinality>10407</dimension_cardinality>
<default_hierarchy>region</default_hierarchy>
<is_virtual>False</is_virtual>
<is_drillthrough_enabled>False </is_drillthrough_enabled>
<dimension_unique_settings>0</dimension_unique_settings>
<is_sql_enabled>True</is_sql_enabled>
</PROPERTY>
<HIERARCHY hierarchy_name="region">
...</HIERARCHY>
...</DIMENSION>
...</CUBE>
</OLAPDATABASE>
  
```

(11) XML

4.2.3.

, 가

Active Server Page(ASP) . ASP

XML

[14]. 가

XML

XSL

. XSL

XML

XML

. XML

XQL

4.2.4.

OLAP

가

OLAP Services

가

DSO(Decision Support Objects)

. DSO

DSO

Analysis Manager

가

[15]. Pilot

Model Template

Model Template

Pilot Model Builder

Import

[16]. Express

ASCII

Express Administrator

Import

[17].

4.3.

가

가

OLAP Services, Pilot DSS, Oracle

Express

OLAP

Budget

HR

Sales

Sales

(12)

. 5

, Product

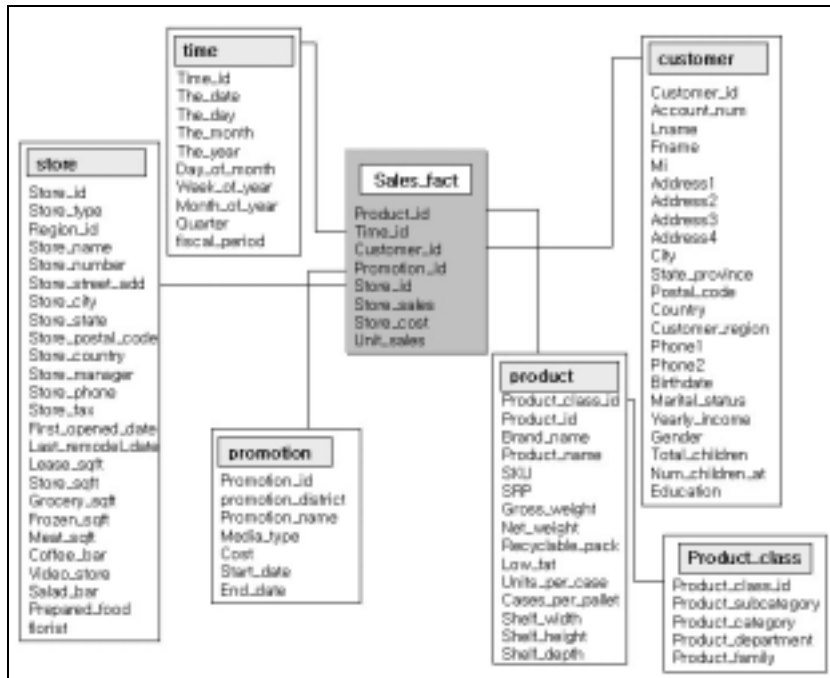
, Time

Store

Store

Store_type

Store_sqft



(12) Sales

MS OLAP Services

Business

SQL Server 2000

가

OLAP

OLAP

가 OLAP

XML

가

OLAP Services

Sales

가

Source

가

OLAP

, Target

OLAP

DTD

OLAP

XML

OLAP

(13) OLAP Services

Sales

가

Pilot DSS

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< >



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 2001 ()
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 : , OLAP, XML



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1985

1985 - 1989

1994

1994

1995 -

: , ,