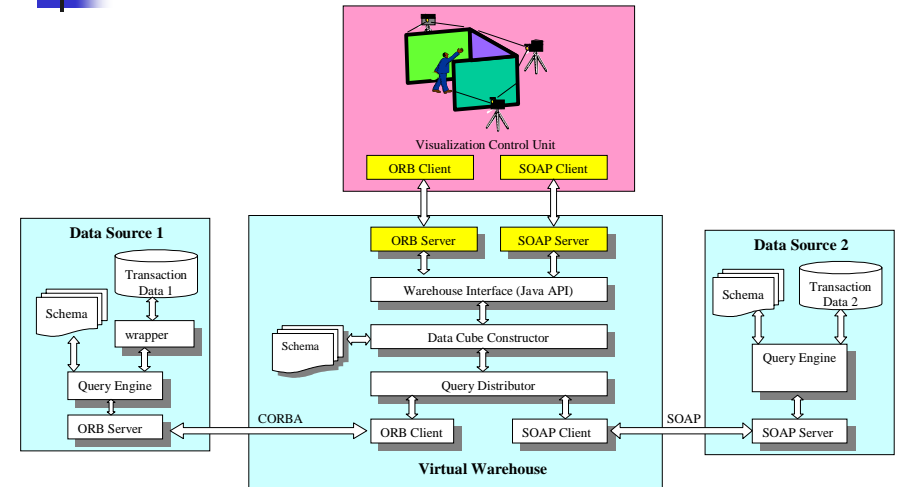


Virtual Data Warehouse System Design and Implementation

By
Yuan Ji & Jeffery Antoniuk

System Architecture



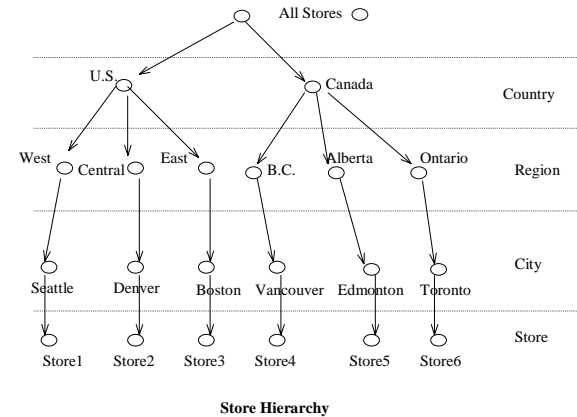
Schema Design

```

<Cube name="FoodMart">
  <Measures>
    <Measure name="Unit_Sales" aggregationFunction="SUM">
      <Title>Unit Sales</Title>
      <DataType>INTEGER</DataType>
    </Measure>
    <Measure name="Store_Cost" aggregationFunction="SUM">
      <Title>Store Cost</Title>
      <DataType>DECIMAL</DataType>
    </Measure>
  </Measures>
  <Dimensions>
    . . .
  </Dimensions>
</Cube>

```

Dimensions





```

<Dimension name="Store" allLevel="yes" allCaption="All Store">
  <Description>The store schema for cube</Description>
  <Levels number="4">
    <Level name="Country" Title="Store Country"/>
    <Level name="Region" Title="Store Region"/>
    <Level name="City" Title="Store City"/>
    <Level name="Store" Title="Store Name" type="base">
      <Property name="Store_Manager" type="String"/>
    </Level>
  </Levels>
  <Unit name="USA">
    <Unit name="West">
      <Unit name="Seattle">
        <Unit name="Store1" baseID="1">
          <Property name="Store_Manager">Bill Gates</Property>
        </Unit>
      </Unit>
    </Unit>
  </Unit>
  . . .
</Unit>
</Dimension>

```

XMDQL

XML Multidimensional Query Language

The **XMDQL** is a query language formatted in XML to query cube data from data warehouse.

XMDQL Format:

```

<XMDQL>
  <SELECT>
    project dimensions and slices
  </SELECT>
  <FROM>
    with cube to query
  </FROM>
  <WHERE>
    filtering constrains
  </WHERE>
</XMDQL>

```



Example

```

<XMDQL>
  <SELECT>
    <Measure name="Store_Sales">
      <Axis dimension="Product">
        <Slice type="mono" title="$n">
          <Path>Office.*</Path>
        </Slice>
      </Axis>
      <Axis dimension="Time">
        <Slice type="mono" title="Quarter $n">
          <Path>1997.*</Path>
        </Slice>
      </Axis>
    </SELECT>
    <FROM>
      <Cube name="AllElectronics"/>
    </FROM>
    <WHERE>
      <Condition dimension="Store">
        <Path>USA</Path>
      </Condition>
    </WHERE>
  </XMDQL>

```

	Computer	Fax	Copier
Quarter Q1	4356	342	56456
Quarter Q2	556	945	234
Quarter Q3	8754	656	3324
Quarter Q4	456	786	4334

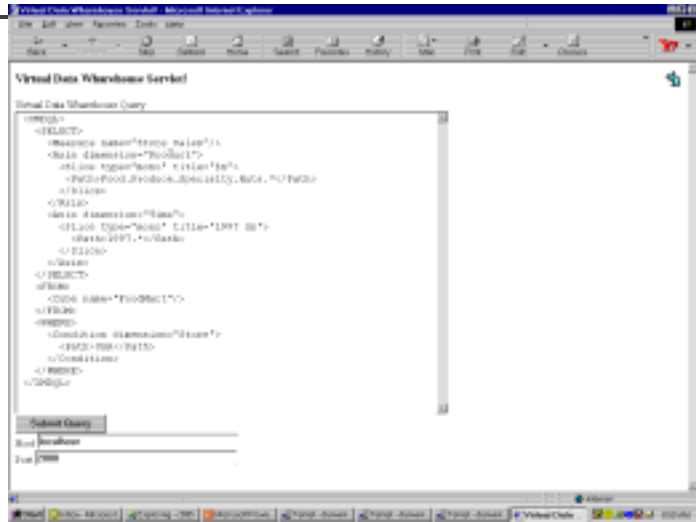


Implementation

- Java language to implement the whole system.
- Apache Tomcat as Java servlet container.
- Java IDL to build CORBA Server and Client.
- Apache Xerces XML parser for Java.



Demo



```
<?xml version="1.0" encoding="UTF-8" standalone="yes" ?>
<SELECT>
  <WHERE name="Trace Name"/>
  <Table Dimension="Product"/>
  <Join type="Inner" with="Date"/>
  <Field Product.DimID,DimID,Name, %/Field>
</Table>
<WHERE>
  <Join Dimension="Date"/>
  <Field Date="Date" Title="1997 01"/>
  <Field Date="Date" Title="1997 02"/>
</Table>
</SELECT>
</Table>
<Field name="Product"/>
</Table>
</WHERE>
</Table>
</SELECT>
</Table>
</WHERE>
</Table>
</SELECT>
</Table>
```

Run Query