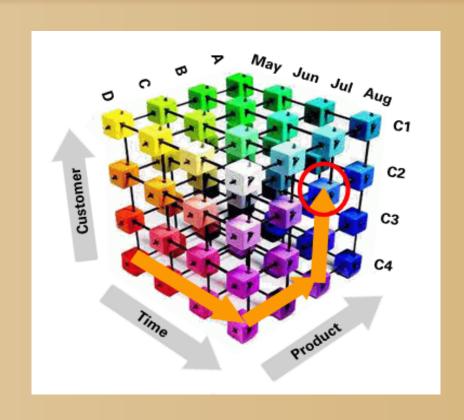# 多维分析基础与 MDX 语言

多维分析基础

- 基本概念
  - Schema
  - Cube
  - Dimension(Measure)
    - Hierarchy
    - Level
    - Member

- BAP 分析主题

MDX(Multi-Dimensional eXpressions)

- MDX->OLAP 与 SQL->RMDB

- Introduced from Microsoft

- Supported by Business Objects,Hyperion,Congos,Jaspersoft, Crystal Reports, Microsoft Excel …. 事实上的标准

MDX 语法结构

- 完整结构：

- [WITH <SELECT WITH clause> [, <SELECT WITH clause> ...]]

  SELECT [* | (<SELECT query axis clause>

     [, <SELECT query axis clause> ...])]

  FROM <SELECT subcube clause>

  [<SELECT slicer axis clause>]

  [<SELECT cell property list clause>]

MDX 语法结构

- 完整结构：

  [WITH <SELECT WITH clause> [, <SELECT WITH clause> ...]]

  SELECT [* | (<SELECT query axis clause>

     [, <SELECT query axis clause> ...])]

  FROM <SELECT subcube clause>

  [<SELECT slicer axis clause>]

  [<SELECT cell property list clause>]

MDX 语法结构

- 举例：

  WITH MEMBER [Measures].[Special Discount] AS [Measures].[Discount Amount] * 1.5

  SELECT [Measures].[Special Discount] on COLUMNS,

  NON EMPTY [Product].[Product].MEMBERS ON Rows

  FROM [Adventure Works]
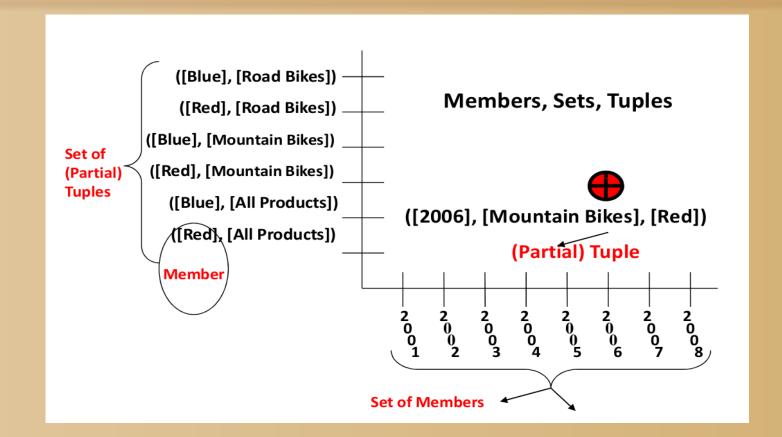
  WHERE [Product].[Category].[Bikes]

MDX 元素

- # 基础元素

  - Set,Tuple
  - Axis,Slicer
  - Cube->Dimension-Hierarchy-Level-Member

    Axis->Set->Members or Tuples->Members from different hierarychies

- # 高级元素

  - Calculated Member
  - Named Set
  - Parent,Children,CurrentMember,DefaultMember,First/Last*...

Set-Tuple-Members

Set of (Partial) Tuples

([Blue], [Road Bikes])
([Red], [Road Bikes])
([Blue], [Mountain Bikes])
([Red], [Mountain Bikes])
([Blue], [All Products])
([Red], [All Products])

Member

Members, Sets, Tuples

([2006], [Mountain Bikes], [Red])

(Partial) Tuple

2001 2002 2003 2004 2005 2006 2007 2008

Set of Members

MDX in BAP

- Everywhere
- Injection Point
  - 维度成员过滤
  - 执行器
    - MDX 函数扩展
- BAP DEMO

MDX 的生产力

- 为什么？
  - 灵活的表达式 ,think about SQL
  - 丰富的函数 :
    - 内置与扩展
    - 分析与预测
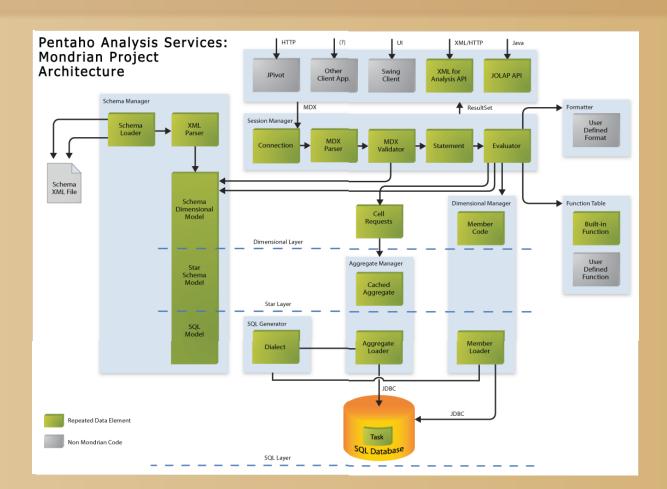   - Excel,VBA 函数
    - BAP 函数
- 函数 DEMO

切入点

- 理解多维和 MDX 基本概念
- 熟悉 MDX 语法
- 多维的思维
- 掌握一些函数"利器"
- 多实践

进一步了解

Pentaho Analysis Services: Mondrian Project Architecture

参考资料

- MDX 用户指南
- Mondrian Document
- Other internet docs, e.g. Microsoft Ref , from Google.
- 最好的资料
  - 对于 Coder:BAP-OLAP 代码
  - 对于顾问专家 :BAP 产品