Business School
UNIVERSITY OF COLORADO DENVER

Information Systems Program

Module 2
Multidimensional data representation and manipulation

Lesson 3: Overview of Microsoft MDX

Lesson Objectives

- Explain basic MDX terminology
- Reflect on MDX commercial impact

Multidimensional Expressions (MDX) History

- Defacto standard developed by Microsoft and later by the XMLA Council

•1997 MS OLAP specification

•1998 MS OLAP services release

•2001 mdXML specification by XMLA Council

•MS 2005 MDX revision

MDX Usage

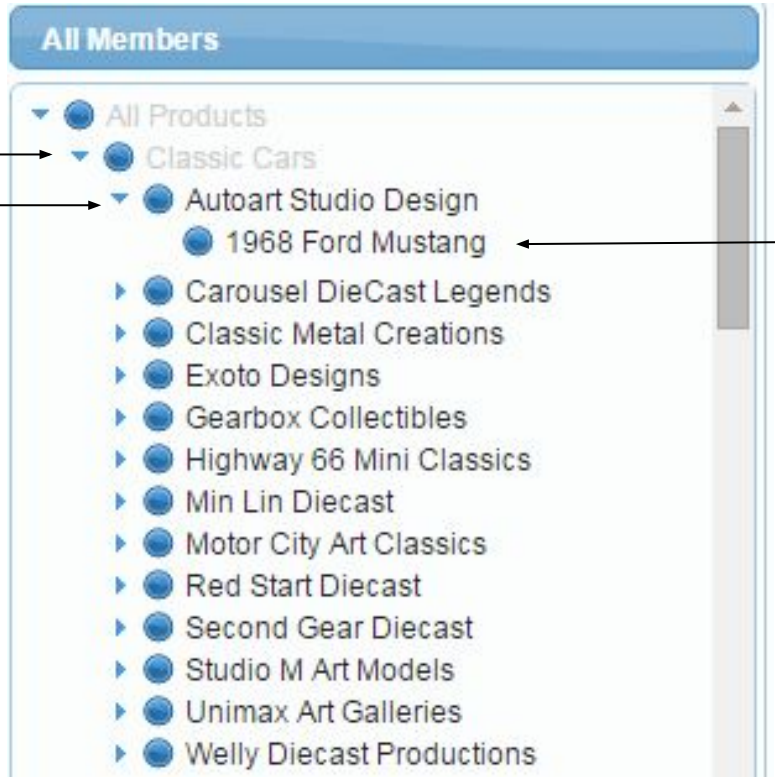
- Foundation for Microsoft products and open source analytics software
- SQL Server Analysis Services and Excel Pivot Tables
- Hyperion, IBM, SAP, and other vendors
- Foundation for open source projects: JPivot, Pivot4J, and Pentaho

Example MDX Cube Structure

Cube Structure

- Measures
  - Quantity
  - Sales
- Markets
  - (All)
  - Territory
  - Country
  - State Province
  - City
- Customers
  - (All)
  - Customer
- Product
  - (All)
  - Line
  - Vendor
  - Product
- Time
  - (All)
  - Years
  - Quarters
  - Months
- Order Status
  - (All)
  - Type

Attribute Hierarchy and Members



Line attribute member

Vendor attribute member

Product attribute member

Product attribute hierarchy

- **Line**
  - **Vendor**
    - **Product**

Steel Wheels Cube Display

	Time				
	All Years	2003	2004	2005	Average
	Measures	Measures	Measures	Measures	Measures
Product	Sales	Sales	Sales	Sales	Sales
Classic Cars	4,091,420	1,514,407	1,838,275	738,738	1,363,807
Motorcycles	1,274,125	397,220	590,580	286,325	424,708
Planes	1,076,757	347,755	528,928	200,074	358,919
Ships	748,671	244,821	375,672	128,178	249,557
Autoart Studio Design	67,592	19,764	36,027	11,801	22,531
Carousel DieCast Legends	208,583	75,184	102,537	30,862	69,528
Min Lin Diecast	79,662	29,691	37,098	12,873	26,554
Red Start Diecast	77,872	25,207	40,948	11,717	25,957
Studio M Art Models	84,190	27,795	39,390	17,005	28,063
Unimax Art Galleries	147,078	42,313	73,966	30,799	49,026
Welly Diecast Productions	83,693	24,867	45,706	13,120	27,898
Trains	234,469	72,802	124,750	36,917	78,156
Trucks and Buses	1,154,281	420,430	531,976	201,875	384,760
Vintage Cars	2,066,226	679,949	997,560	388,718	688,742
Average	818,919	282,876	383,672	152,371	272,973

MDX Terminology Notes

- Tuple
  - Cell identifier
  - One member from each dimension
- Axis: dimension selected in a query (source cube cells)
- Slicer: combination of dimension members (result cube cells)

Summary

- Foundation for several Microsoft products
- Evolved into a de facto standard for data cubes
- Basic data cube features demonstrated