

Business Analytics **Forum**

The Premier Conference for Information and Analytics

3 · 5th 2010

Gold Coast Convention and Exhibition Centre Queensland, Australia



Dimensional Reporting

Philip Wittann
Business Analytics



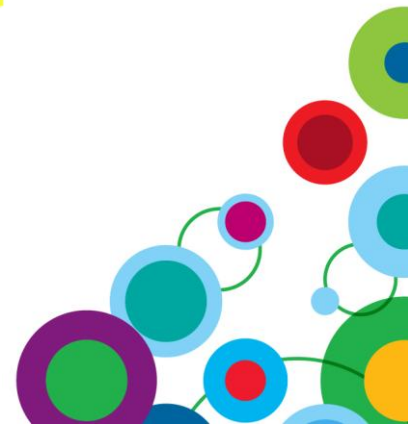
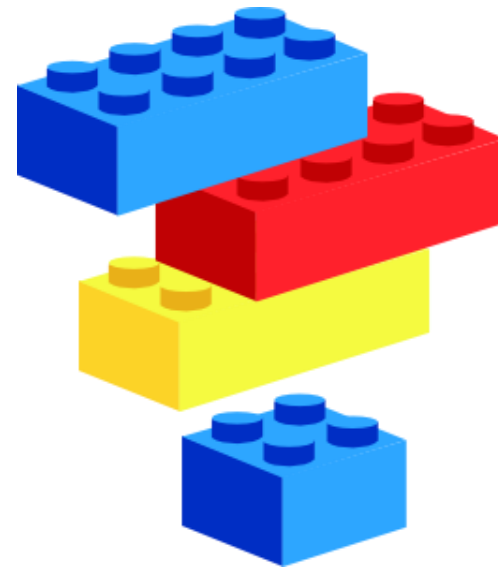
Dimensional Reporting Concepts

- Query languages
 - Relational sources use SQL
 - Dimensional sources use MDX (MultiDimensional eXpression)

SQL




MDX



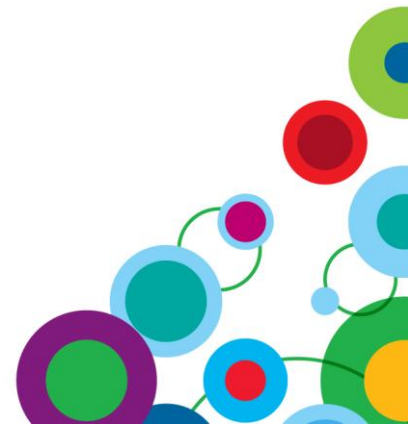
Dimensional Reporting Concepts

Query Axes – Lists

- *One query axis*



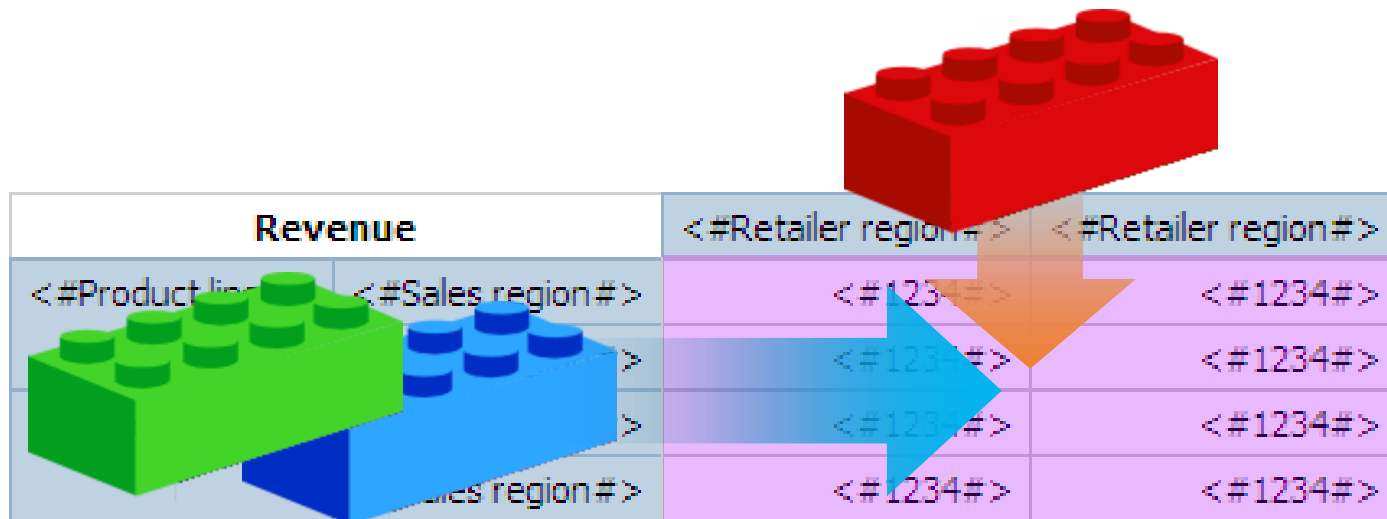
Product line	Wholesaler region	Retailer region	Revenue
<Product line>	<Wholesaler region>	<Retailer region>	<Revenue>
<Product line>	<Wholesaler region>	<Retailer region>	<Revenue>
<Product line>	<Wholesaler region>	<Retailer region>	<Revenue>
Summary			<Total(Revenue)>



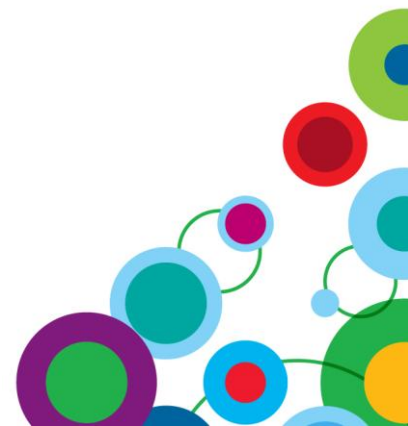
Dimensional Reporting Concepts

Query Axes – Crosstabs and Charts

- *Multiple axes*
- *Evaluated independently**



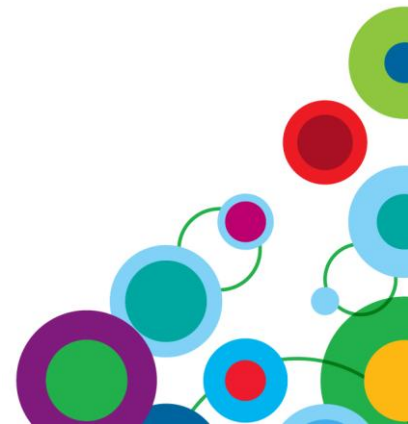
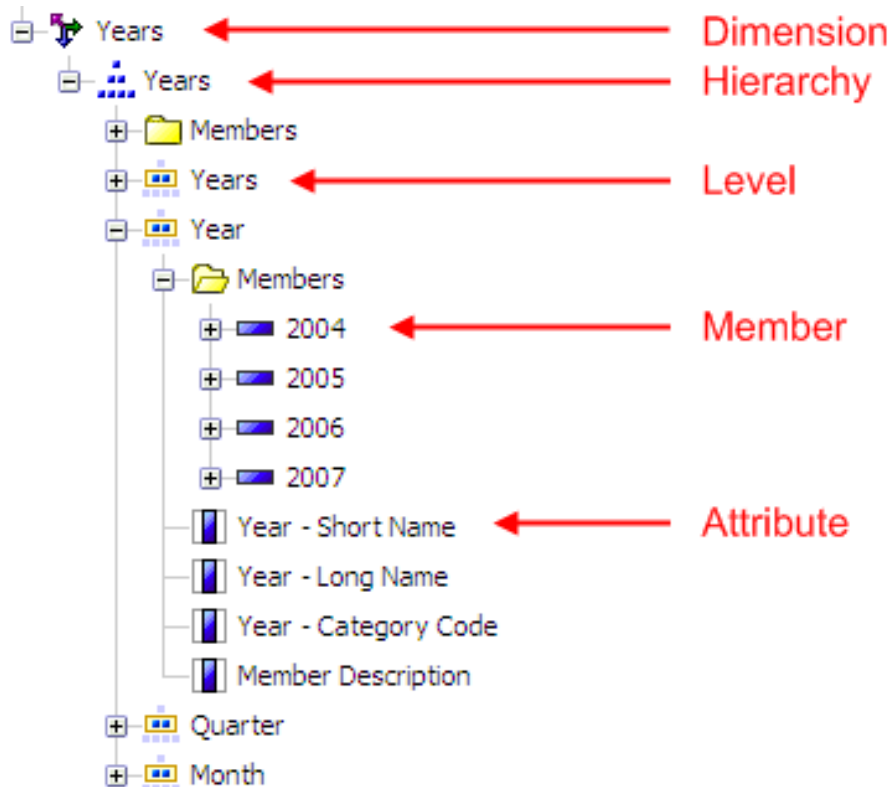
* More complex expressions may depend on the context from another axis to determine the value for a measure cell





What makes up a “block”?

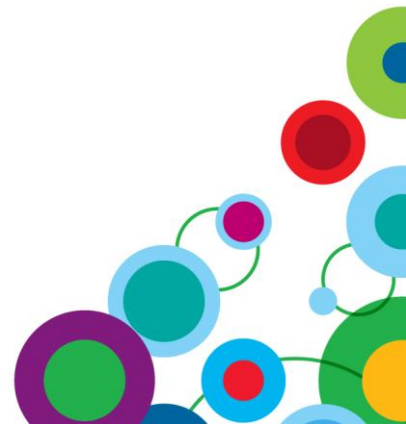
- A Member is the basic unit of dimensional reporting
- A Member can have many attributes
- A Member does not contain a measure value
- Members can be combined into larger units called Sets





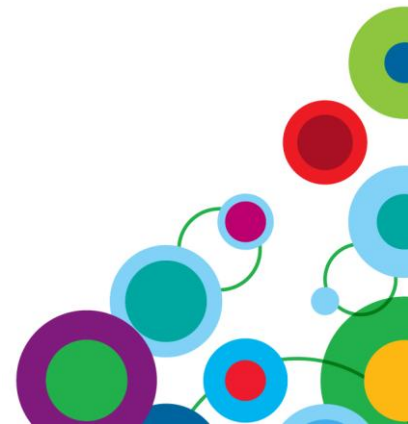
Working with Members and creating Sets

- A set can be created from
 - An explicit list of members
 - A dimensional function
- Sets can be reused within a query to satisfy other expressions



Working with Members and creating Sets

Demo





Cross products and sparse data

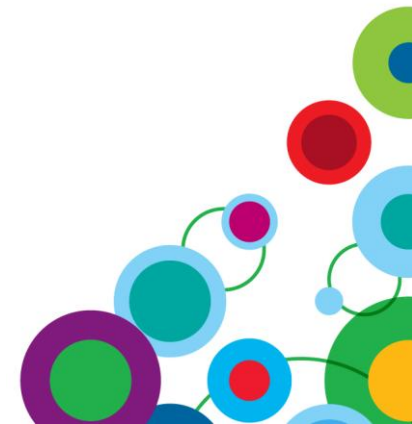
- Relational (SQL) sources will limit data based on inner joins
- OLAP Sources will create cross products for dimensions on the same axis

SQL

		Revenue
2004	Outdoor Protection	36,165,521.07
	Personal Accessories	391,647,093.61
	Camping Equipment	332,986,338.06
	Golf Equipment	153,553,850.98
2005	Camping Equipment	402,757,573.17
	Outdoor Protection	25,008,574.08
	Golf Equipment	168,006,427.07
	Mountaineering Equipment	107,099,659.94
2006	Personal Accessories	456,323,355.9
	Camping Equipment	500,382,422.83
	Outdoor Protection	10,349,175.84
	Golf Equipment	230,110,270.55
	Personal Accessories	594,009,408.42
2007	Mountaineering Equipment	161,039,823.26
	Golf Equipment	174,740,819.29
	Camping Equipment	352,910,329.97
	Outdoor Protection	4,471,025.26
	Personal Accessories	443,693,449.85

OLAP

		Revenue
2004	Camping Equipment	332,986,338
	Mountaineering Equipment	
	Personal Accessories	391,647,094
	Outdoor Protection	36,165,521
2005	Golf Equipment	153,553,851
	Camping Equipment	402,757,573
	Mountaineering Equipment	107,099,660
	Personal Accessories	456,323,356
2006	Outdoor Protection	25,008,574
	Golf Equipment	168,006,427
	Camping Equipment	500,382,423
	Mountaineering Equipment	161,039,823
	Personal Accessories	594,009,408
2007	Outdoor Protection	10,349,176
	Golf Equipment	230,110,271
	Camping Equipment	352,910,330
	Mountaineering Equipment	141,520,650
	Personal Accessories	443,693,450
	Outdoor Protection	4,471,025
	Golf Equipment	174,740,819





Cross products and sparse data

Result size

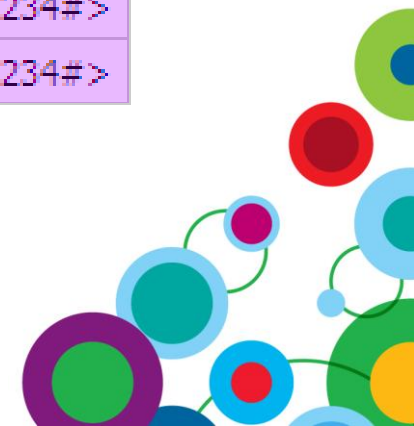
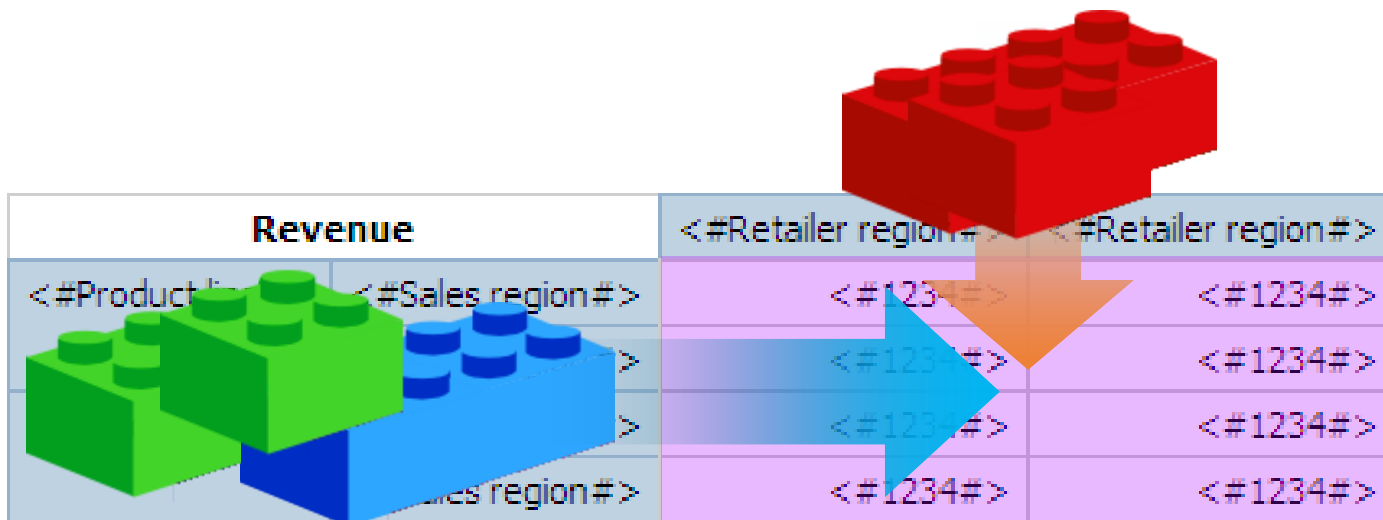
- OLAP cross products have the potential for much larger result sets
- Example:
 - Product dimension (100 members)
 - Time dimension (24 months)
 - Store dimension (100 stores)
 - Warehouse dimension (10 warehouses)
 - Nesting all these members will produce
$$100 \text{ (Product)} * 24 \text{ (Months)} * 100 \text{ (Stores)} * 10 \text{ (Warehouses)}$$
$$= 2,400,000 \text{ rows}$$



Cross products and sparse data

Impact on filtering

- *Detail filters may be applied after retrieving a result set*
- *Dimensional filtering can be better performed in the sets on the axes*





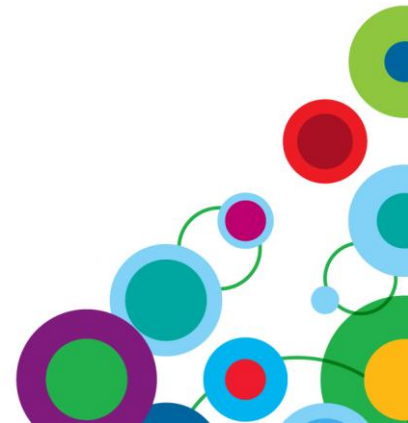
Cross products and sparse data

Results of set-based filtering

- Example:
 - Product dimension (100 members) → (20 members)
 - Time dimension (24 months)
 - Store dimension (100 stores) → (15 members)
 - Warehouse dimension (10 warehouses) → (4 members)

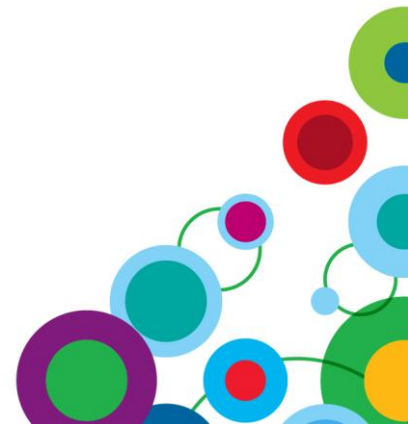
 - Nesting all these members will produce
 - $100 \text{ (Product)} * 24 \text{ (Months)} * 100 \text{ (Stores)} * 10 \text{ (Warehouses)}$
 $= 2,400,000 \text{ rows}$

 - $20 \text{ (Product)} * 24 \text{ (Months)} * 15 \text{ (Stores)} * 4 \text{ (Warehouses)}$
 $= 28,800 \text{ rows}$



Cross products and sparse data

Filtering demo





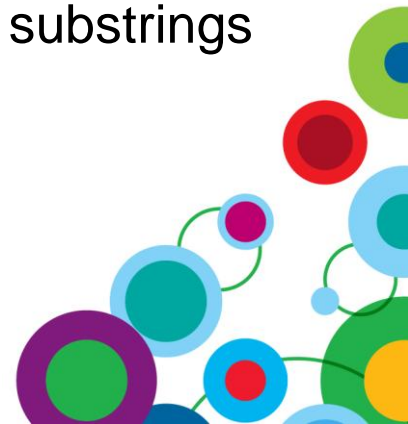
OLAP Performance

Do

- Design for reuse
- Use dimensional functions to filter sets
- Use the union, except, and intersect **functions** to combine sets
- Use the member summary functions to roll up a measure for a set

Avoid

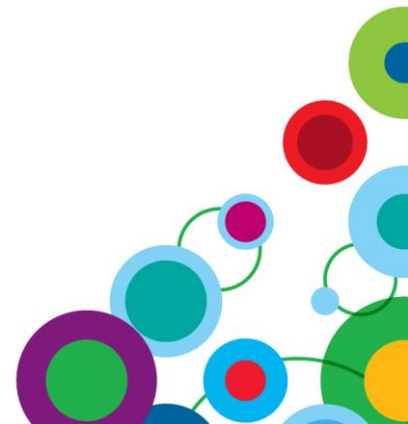
- Filtering on attributes (such as the member caption)
- Detail filters on measures
- Union, Except, Intersect, and Join operations between two queries
- Direct addition operations between members
- Relational functions such as the string operations for substrings and concatenation





Examples of filtering and aggregation with reuse

Relative Time demo





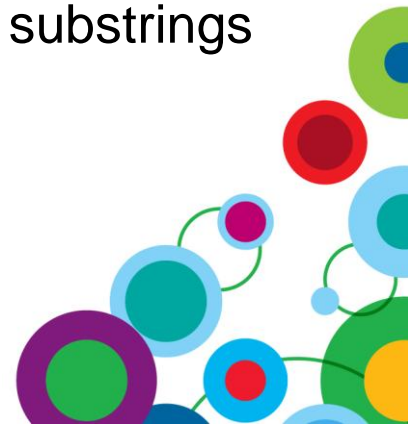
OLAP Performance

Do

- Design for reuse
- Use dimensional functions to filter sets
- Use the union, except, and intersect **functions** to combine sets
- Use the member summary functions to roll up a measure for a set

Avoid

- Filtering on attributes (such as the member caption)
- Detail filters on measures
- Union, Except, Intersect, and Join operations between two queries
- Direct addition operations between members
- Relational functions such as the string operations for substrings and concatenation



WIN *an Apple[®] iPad*

Please remember to complete your session evaluation online at the Communication Station or point your Smart Phone browser to:

www.spss.com/goldcoast



For a chance to win an Apple[®] iPad

