

Oracle BI 11g Reports and Dashboards

Hierarchical Columns

PEAK
indicators

Hierarchical Columns

Agenda

- Overview
- Expand/Collapse
- Asymmetric Drilling
- Hierarchy Properties
- Hierarchy Types
 - Balanced
 - Unbalanced / Ragged
 - Skipped Level
 - Parent-Child
- Performance Considerations



Hierarchical Columns Overview

Overview

- “Hierarchical Columns” is a major new feature with Oracle BI 11g, extending the previous 10g “drill-down” functionality with “Attribute Columns”
- The new Hierarchical Column brings a new “OLAP” look and feel to the product – but importantly the feature works with any type of data source



Sales History for Vision Technology

Attribute Column
(Drill-Down)

Choose Dimension Choose Fact

Hierarchical Column
(Expand/Collapse)

Total Revenue (Millions)								
▽ Total								
Business Group		▷ 2001	▷ 2002	▷ 2003	▷ 2004	▷ 2005	▷ 2006	▷ 2007
Vision Benelux	2,736.2	222.5	399.5	415.3	422.4	471.5	388.0	417.1
Vision East Europe	594.1	48.8	75.3	98.2	91.0	93.6	94.3	93.0
Vision Nordics	1,273.0	86.5	57.5	56.7	261.2	268.7	267.7	274.8
Vision UK and Ireland	120.1	8.2	4.2	16.8	17.3	17.7	39.5	16.4
Vision West Europe	864.0	72.1	74.1	369.9	116.7	106.2	75.6	49.5
Grand Total	5,587.6	438.0	610.5	957.0	908.5	957.7	865.0	850.8

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Hierarchical Columns
Expand/Collapse

Expand/Collapse

- “Hierarchical Columns” can be identified by having a ▶ icon next to the Dimension value
 - You can expand the branch of the hierarchy by clicking on the ▶
 - Alternatively, you can collapse a branch by clicking on ▼



Sales History for Vision Technology

Choose Dimension

Fact Total Revenue

Total Revenue (Millions)								
▼ Total								
Business Group		▶ 2001	▶ 2002	▶ 2003	▶ 2004	▶ 2005	▶ 2006	▶ 2007
Vision Benelux	2,736.2	222.5	399.5	415.3	422.4	471.5	388.0	417.1
Vision East Europe	594.1	48.8	75.3	98.2	91.0	93.6	94.3	93.0
Vision Nordics	1,273.0	86.5	57.5	56.7	261.2	268.7	267.7	274.8
Vision UK and Ireland	120.1	8.2	4.2	16.8	17.3	17.7	39.5	16.4
Vision West Europe	864.0	72.1	74.1	369.9	116.7	106.2	75.6	49.5
Grand Total	5,587.6	438.0	610.5	957.0	908.5	957.7	865.0	850.8

“Total” level expanded

“Year” level collapsed

PEAK
indicators

Hierarchical Columns
Asymmetric Drilling

Asymmetric Drilling

- One of the big differences with Hierarchical Columns compared to Attribute Columns is that when you “drill” you still see the other non-expanded parts of the tree structure
 - this is called Asymmetric Drilling
- For example, below we have expanded the Year “2001”, but we still see all the other years collapsed
 - Note how we also still see data aggregated to Year “2001” and “Total” level

Total Revenue (Millions)												
Business Group	▽ Total											
	▽ 2001						▷ 2002	▷ 2003	▷ 2004	▷ 2005	▷ 2006	▷ 2007
		▷ 2001 Q 1	▷ 2001 Q 2	▷ 2001 Q 3	▷ 2001 Q 4							
Vision Benelux	2,736.2	222.5	109.5	101.2		11.8	399.5	415.3	422.4	471.5	388.0	417.1
Vision East Europe	594.1	48.8	24.1	23.1		1.7	75.3	98.2	91.0	93.6	94.3	93.0
Vision Nordics	1,273.0	86.5	34.3	48.9	0.0	3.2	57.5	56.7	261.2	268.7	267.7	274.8
Vision UK and Ireland	120.1	8.2	4.4	3.8	0.0		4.2	16.8	17.3	17.7	39.5	16.4
Vision West Europe	864.0	72.1	11.4	60.6	0.0	0.1	74.1	369.9	116.7	106.2	75.6	49.5
Grand Total	5,587.6	438.0	183.5	237.6	0.0	16.9	610.5	957.0	908.5	957.7	865.0	850.8

Asymmetrical Drilling

- You can keep expanding the Hierarchy Levels until you reach the “leaf” or bottom level of the hierarchy:

Total Revenue (Millions)																			
▼ Total																			
Business Group	▼ 2001																		
	▼ 2001 Q 1																		
	▼ 2001 / 01 Week01																		
	1/1/2001 12:00:00 AM	1/2/2001 12:00:00 AM	1/3/2001 12:00:00 AM	1/4/2001 12:00:00 AM	1/5/2001 12:00:00 AM	1/6/2001 12:00:00 AM	1/7/2001 12:00:00 AM	▼ 2001 Week02	▼ 2001 Week03	▼ 2001 Week04	▼ 2001 Week05	▼ 2001 / 02	▼ 2001 / 03	▼ 2001 Q 2	▼ 2001 Q 3				
Vision Benelux	2,736.2	222.5	109.5	37.6	7.2	0.9	0.8	2.1	1.3	0.6	0.2	1.3	8.8	8.8	12.2	0.5	37.7	34.2	101.2
Vision East Europe	594.1	48.8	24.1	8.0	1.9	0.2	0.2	0.5	0.3	0.2	0.2	0.3	2.0	1.8	2.3	0.1	8.0	8.0	23.1
Vision Nordics	1,273.0	86.5	34.3	24.0	6.4	1.1	1.0	1.0	0.8	1.1	0.7	0.7	5.2	5.4	5.9	1.1	5.2	5.1	48.9
Vision UK and Ireland	120.1	8.2	4.4	1.6	0.5		0.1	0.0	0.2	0.1	0.0	0.1	0.4	0.4	0.3		1.5	1.4	3.8
Vision West Europe	864.0	72.1	11.4	3.9	0.8	0.1	0.1	0.2	0.2	0.1	0.0	0.2	1.0	1.1	0.9	0.1	3.7	3.7	60.6
Grand Total	5,587.6	438.0	183.5	75.1	16.9	2.4	2.1	3.8	2.8	2.1	1.1	2.6	17.3	17.5	21.6	1.8	56.1	52.3	237.6

Asymmetrical Drilling

Adding to an Analysis

- Once it has been added to the Subject Area, a Hierarchical Column can be included in an Analysis in the same way as any other Dimension attribute

The screenshot displays the Oracle Business Intelligence web interface. The top navigation bar includes the Oracle logo, 'Business Intelligence' text, a search bar, and links for 'Advanced', 'Administration', 'Help', and 'Sign Out'. Below this is a secondary navigation bar with 'Home', 'Catalog', 'Favorites', 'Dashboards', 'New', 'Open', and 'Signed In As weblogic'. The main content area is titled 'Sales History' and features tabs for 'Criteria', 'Results', 'Prompts', and 'Advanced'. The 'Criteria' tab is active, showing a 'Subject Areas' pane on the left and a 'Selected Columns' pane on the right. The 'Subject Areas' pane lists various dimensions under 'Sales Orders', including 'Time', 'Customer', 'Contact', 'Organization', 'Product', 'Sales Rep', 'Order', and 'Facts'. The 'Time' dimension is expanded, showing 'Date', 'Week', 'Month', 'Quarter', and 'Year'. A red box highlights the 'Time' dimension, and a red arrow points from it to the 'Selected Columns' pane. The 'Selected Columns' pane contains a table with three columns: 'Time', 'Organization', and 'Facts'. The 'Time' column is selected, and its properties are displayed in the 'Selected Columns' pane. The 'Filters' pane at the bottom shows 'Is Prompted Filters for Sales Orders'.

Oracle Business Intelligence

Search: All [v] [x]

Advanced Administration Help Sign Out

Sales History Home Catalog Favorites Dashboards New Open Signed In As weblogic

Criteria Results Prompts Advanced

Subject Areas

- Sales Orders
 - Time
 - Date
 - Week
 - Month
 - Quarter
 - Year
 - Customer
 - Contact
 - Organization
 - Product
 - Sales Rep
 - Order
 - Facts

Selected Columns

Double click on column names in the Subject Areas pane to add them to the analysis. Once added, drag-and-drop columns to reorder them. Edit a column's properties, formula and filters, apply sorting, or delete by clicking or hovering over the button next to its name.

Time	Organization	Facts
[x] Time	[x] Column Group (Default: Business Group)	[x] Column Group (Default: Total Revenue (Millions))

Filters

Add filters to the analysis criteria by clicking on Filter option for the specific column in the Selected Columns pane, or by clicking on the filter button in the Filter pane header. Add a saved filter by clicking on add button after selecting its name in the catalog pane.

Is Prompted Filters for Sales Orders



Hierarchical Columns

Hierarchy Properties

Hierarchy Properties

- Importantly, it is possible to define different properties for each level within the Hierarchy e.g. font weight, background colour etc

The screenshot shows the 'Selected Columns' pane in a data analysis tool. It contains three main sections: 'Time', 'Organization', and 'Facts'. The 'Time' section is expanded, showing a hierarchy of levels: Time, Total, Year, Quarter, Month, Week, and Detail. A red box highlights the 'Hierarchy Level Properties' button, which is located below the 'Time' section. A red arrow points from this button to a separate dialog box titled 'Hierarchy Level Properties'. This dialog box has tabs for 'Style', 'Hierarchy Level Format', 'Data Format', 'Conditional Format', 'Interaction', and 'Write Back'. The 'Style' tab is currently selected.

Selected Columns

Double click on column names in the Subject Areas pane to add them to the analysis. Once added, drag-and-drop columns to reorder them. Edit a column's properties, formula and filters, apply sorting, or delete by clicking or hovering over the button next to its name.

Time	Organization	Facts
Time	Column Group (Default: Business Group)	Column Group (Default: Total Revenue (Millions))
Total		
Year		
Quarter		
Month		
Week		
Detail		

Hierarchy Level Properties

Hierarchy Level Properties

Style | Hierarchy Level Format | Data Format | Conditional Format | Interaction | Write Back



Hierarchical Columns

Hierarchy Types

Hierarchy Types

- Hierarchical Columns enable the support for various types of hierarchies:
 - Balanced
 - Unbalanced / Ragged
 - Skipped-Level
 - Parent-Child

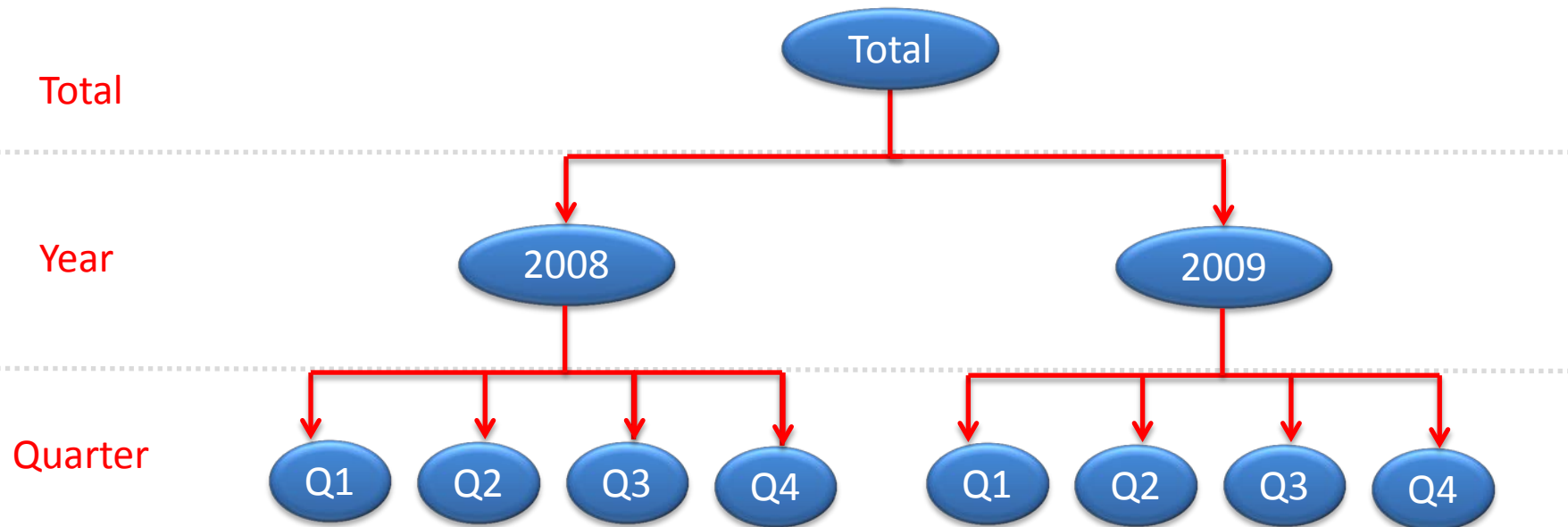
Product Category	Total Revenue (Millions)				
	Vision	Vision East	Vision	Vision UK and	Vision West Europe
▼ Vision High-Tech	2736.24	594.15	1273.03	120.13	864.03
▷ Computer Parts and Components	246.51	58.67	120.92	9.80	112.94
▷ Computer Systems	37.77	6.42	14.98	1.26	9.86
▷ Documentation	38.49	6.90	14.59	0.81	4.39
▷ Electromechanical Components	39.38	9.41	20.61	1.67	7.83
▷ Electronic Components	1516.35	323.55	696.67	53.48	472.45
▷ Interconnect Components	117.51	24.50	53.49	3.79	24.34
▷ Mechanical Components	109.18	23.73	53.58	4.02	23.58
▷ Networking Components	36.61	9.55	19.39	1.44	8.19
Product Requirements	397.88	92.80	190.19	37.50	123.62
Service Plans ◀ ▶	61.33	10.38	23.76	1.84	9.98
▷ Software	93.76	18.73	45.60	2.89	58.27
▷ Test, Tools & Supplies				1.64	8.58

Here we have a Parent-Child hierarchy, where not all the hierarchy members have child nodes

Hierarchy Types

Balanced Hierarchies

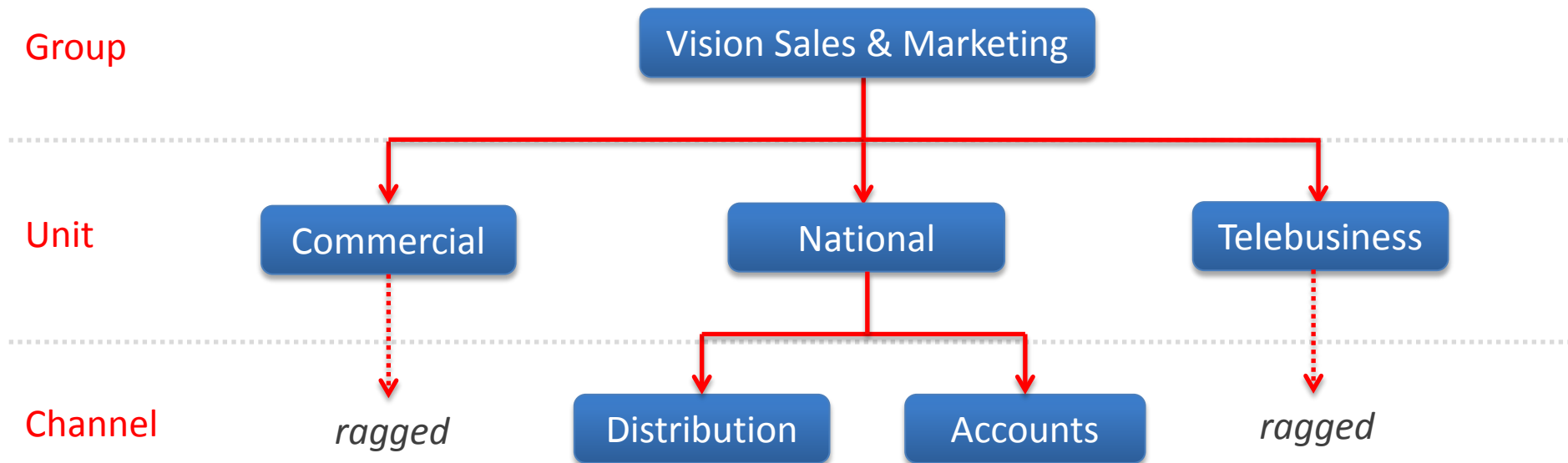
- Fixed number of levels, each level has a name
- All branches of the hierarchy are complete from top to bottom



Hierarchy Types

Unbalanced / Ragged Hierarchies

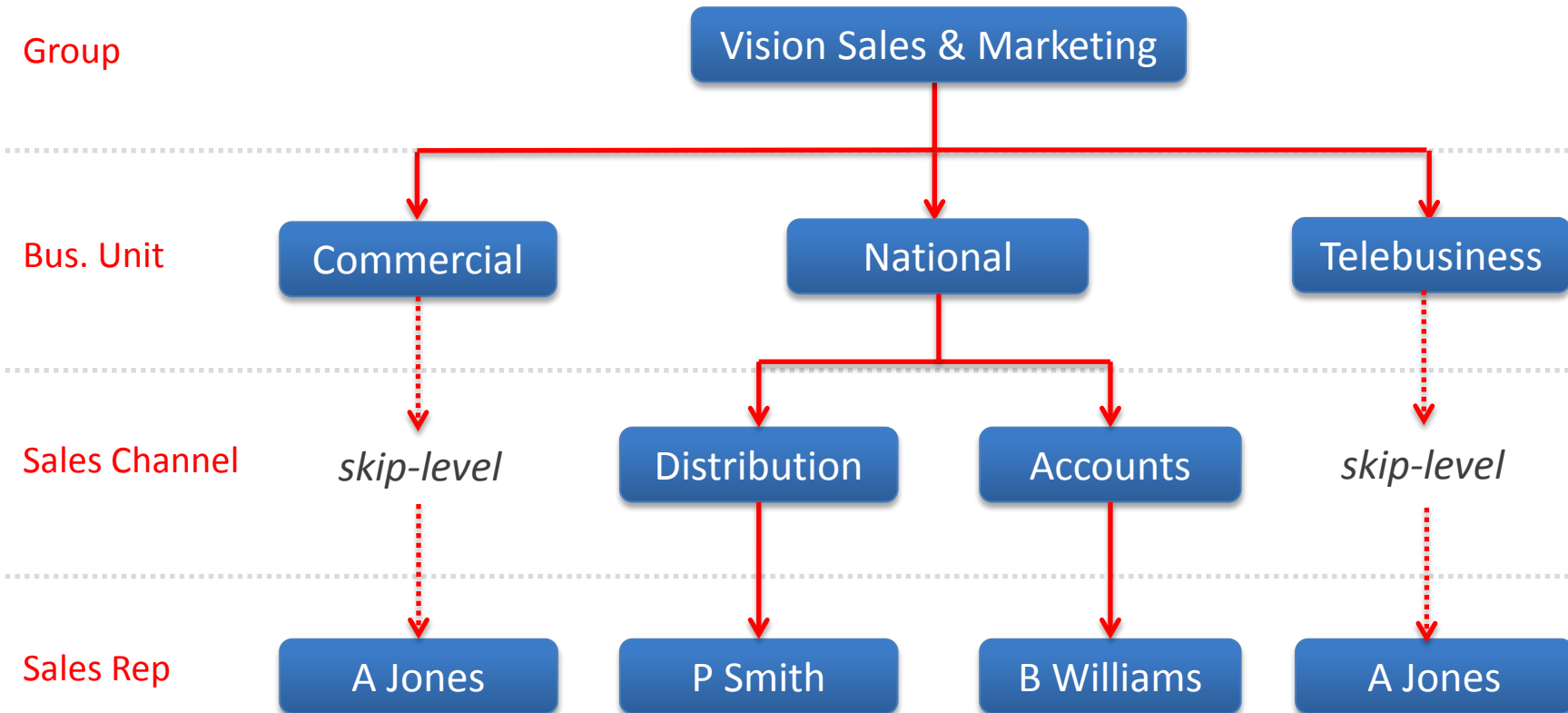
- Similar properties to a Balanced hierarchy, but not all branches are complete from top to bottom



Hierarchy Types

Skip-Level Hierarchies

- Skip-Level hierarchies are similar to Balanced hierarchies, but some branches within the hierarchy may skip certain levels

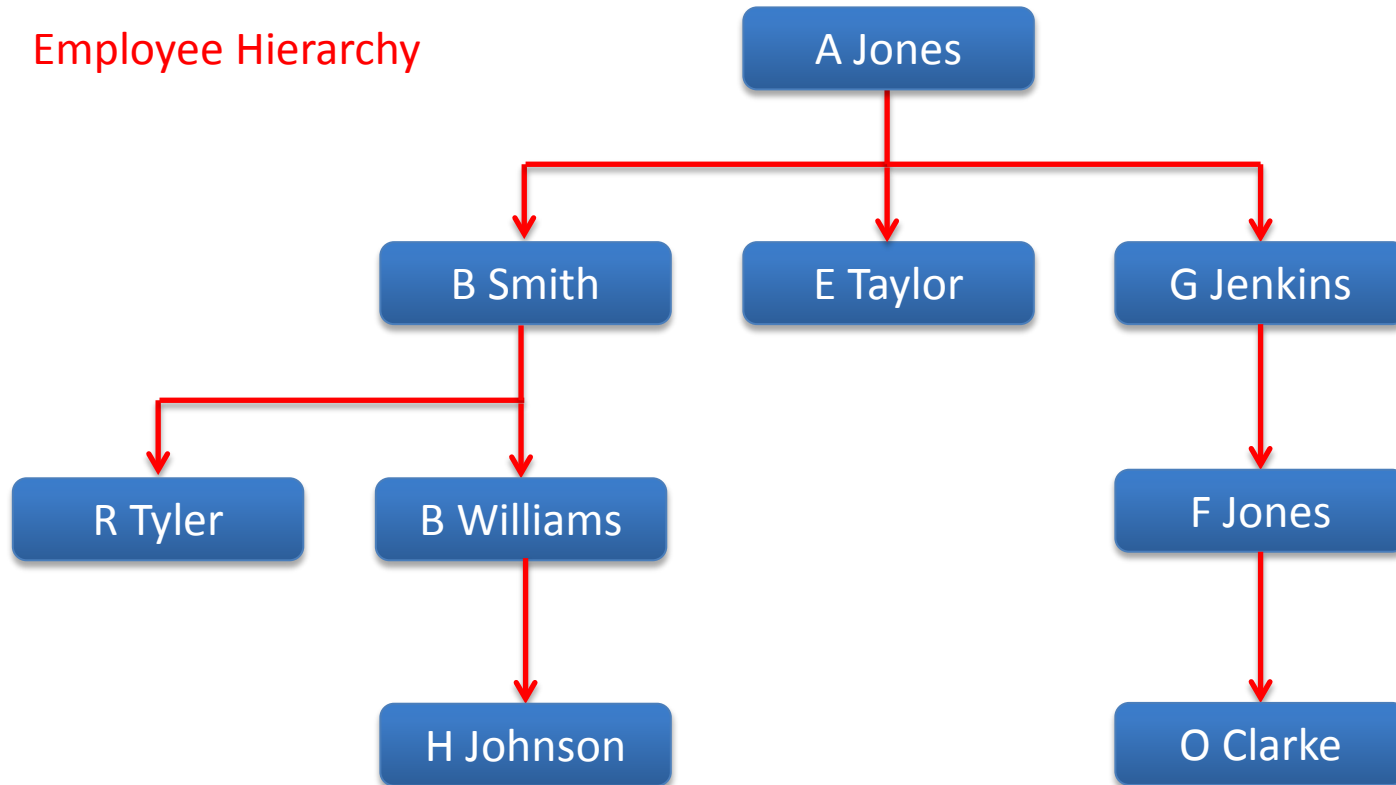


Hierarchy Types

Parent-Child / Value-Based Hierarchies

- No levels, all “members” are of the same type
- Number of levels is purely data-driven
- Member names should be unique across entire hierarchy

Employee Hierarchy



Hierarchical Columns

Representing Ragged Hierarchies

- NULL values must appear in any in Ragged nodes:

*Attribute
Columns*

Group ▲▼	Business Unit	Sales Channel	Total Revenue (Millions)
Vision Sales & Marketing	Commercial Sales		803.13
	National Sales	Distribution Sales	776.57
		National Accounts	1523.09
			1481.43
	Telebusiness		1003.27
Grand Total			5587.49

*Hierarchical
Columns*

Sales Rep (Ragged)	Total Revenue (Millions)
▼ Total	5587.49
▼ Vision Sales & Marketing	5587.49
Commercial Sales	803.13
► National Sales	3781.08
Telebusiness	1003.27
Grand Total	5587.57

Sales Rep (Ragged)	Total Revenue (Millions)
▼ Total	5587.49
▼ Vision Sales & Marketing	5587.49
Commercial Sales	803.13
▼ National Sales	3781.08
Distribution Sales	776.57
National Accounts	1523.09
Telebusiness	1003.27
Grand Total	5587.57

Notice how the £3781.08 total for “National Sales” is not the sum of all its child nodes. This is because the total includes the £1481.43 from its ragged node

Hierarchy Types

Representing Skip-Level Hierarchies

- Similarly, NULL values must appear in any in Skip-Level nodes:

*Attribute
Columns*

Group	Business Unit	Sales Channel	Sales Rep	Total Revenue (Millions)
Vision Sales & Marketing	Commercial Sales		Benson, Ms. Julianne	0.01
			Bull, Mr. Scott Eric	32.58
			Smith, Mr. Joseph	270.92
	National Sales	Distribution Sales	Browne, Mr. Jackson	33.72
			Camp, Mrs. Georgina	31.69
Grand Total				368.93

*Hierarchical
Columns*

Sales Rep (Skip)	Total Revenue (Millions)
▼ Total	368.93
▼ Vision Sales & Marketing	368.93
▼ Commercial Sales	303.51
Benson, Ms. Julianne	0.01
Bull, Mr. Scott Eric	32.58
Smith, Mr. Joseph	270.92
▼ National Sales	65.42
▶ Distribution Sales	65.42
Grand Total	368.93

“Commercial Sales” skips Sales Channel and has Sales Reps for its Child Nodes

“National Sales” does not skip and therefore has a Sales Channel as its Child Node



Hierarchical Columns

Performance Considerations

Performance Considerations

- Supporting Ragged and/or Skip-Level Hierarchies does increase the overhead on the underlying data source, the queries are obviously tuned by the BI Server (making use of aggregates etc)

Sales Rep (Skip)	Total Revenue (Millions)
▼ Total	368.93
▼ Vision Sales & Marketing	368.93
▼ Commercial Sales	303.51
Benson, Ms. Julianne	0.01
Bull, Mr. Scott Eric	32.58
Smith, Mr. Joseph	270.92
▼ National Sales	65.42
► Distribution Sales	65.42

5 Logical SQL Queries
“Unioned” Together

Total Sales

union

Sales by Group

union

Sales By Business Unit

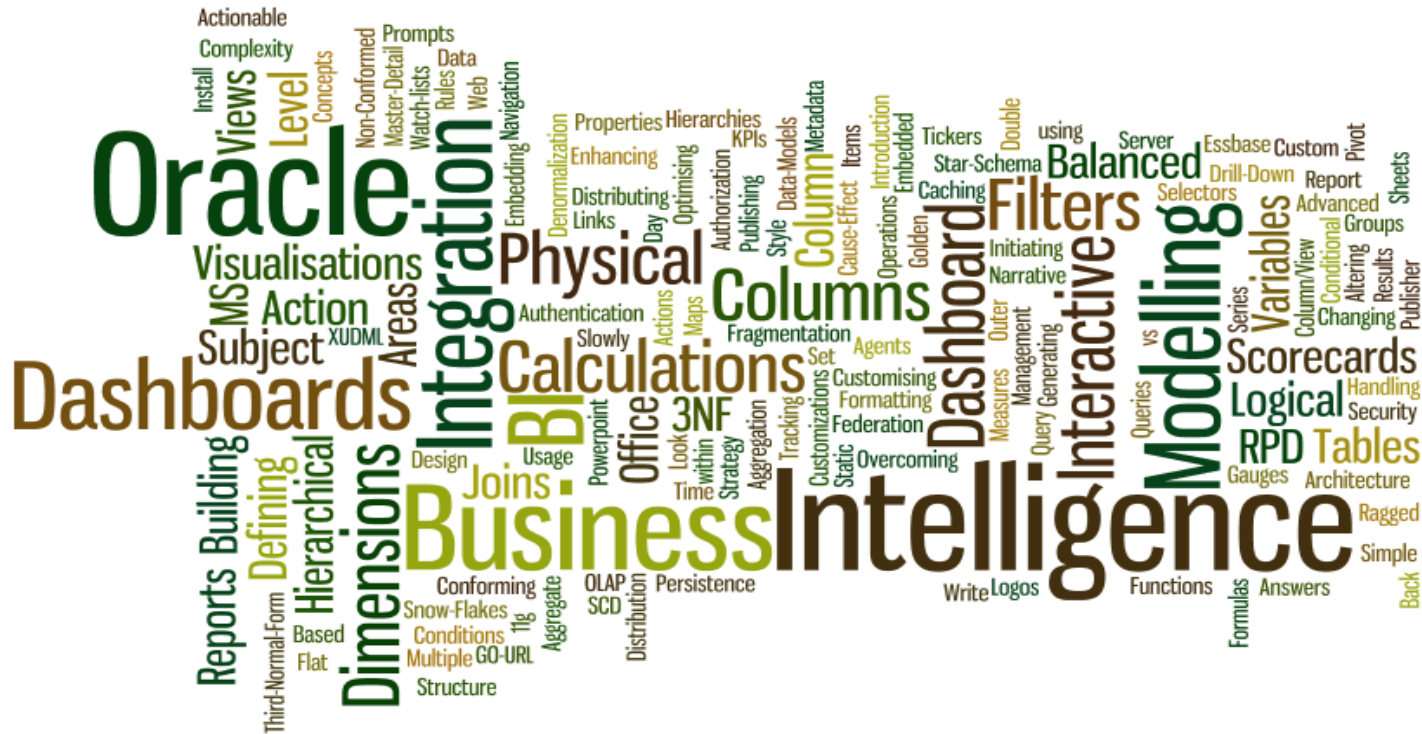
union

Sales by Sales Channel

union

Sales by Sale Rep

Questions?



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Helping Your Business
Intelligence Journey