



XBRL – Dimensional Taxonomies

Digital Accounting Research Conference

–
Ignacio Hernández-Ros
ihr@xbrl.org

© 2005 XBRL International, All Rights Reserved
www.xbrl.org/Legal

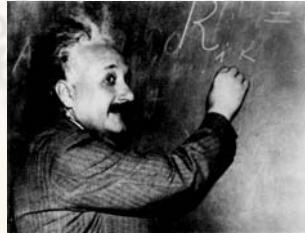
Transforming Business Reporting

XBRL Overview

- XBRL Taxonomies: Concepts dictionary
- 5 XBRL Linkbases:
 - Presentation
 - Calculation
 - Definition
 - Labels
 - References
- XBRL Documents refers to XBRL Taxonomies

Multidimensional information

- How many dimensions exist?
- At least 3 in space
- 4 if we add the time dimension
- Or even more (11?) if you trust the physics that explains the quantum theories...
- But real business may have more than 11 dimensions



© 2005 XBRL International, All Rights Reserved
www.xbrl.org/Legal

Multidimensional information

This is a business dimension, the concept Department is the "Dimensional element"

This is another Dimension

These are concepts defined in a XBRL Taxonomy

These are the facts reported in the instance. Each one of them have dimensions with (name and value)

This is the time dimension

This is the "Dimension domain"

A,B and C are "Members of the domain"

Summary Pivot Table by Quarter

Quarters	Department	Product	Sales	Profit	%
Qtr1	100	A	33,000	10,379	31.5%
		B	66,000	21,000	31.8%
		C	46,200	14,700	
Qtr1 Total			145,200	46,079	
Qtr2	100	A	52,000	15,000	28.8%
		B	72,000	24,000	33.3%
		C	50,400	16,800	33.3%
Qtr2 Total			158,400	52,305	33.0%
Qtr3	100	A	30,000	10,107	27.0%
		B	60,000	23,000	30.0%
		C	42,000	12,600	30.0%
Qtr3 Total			132,000	38,707	29.3%
Qtr4	100	A	35,000	10,185	29.1%
		B	70,000	23,000	32.9%
		C	49,000	16,100	32.9%
Qtr4 Total			154,000	49,285	32.0%
Grand Total			589,600	186,376	31.6%

...and then, with a few mouse moves, the perspective is shifted to quarterly results...

Source: <http://www.aicpa.org/pubs/jofa/dec1998/exh3.htm>

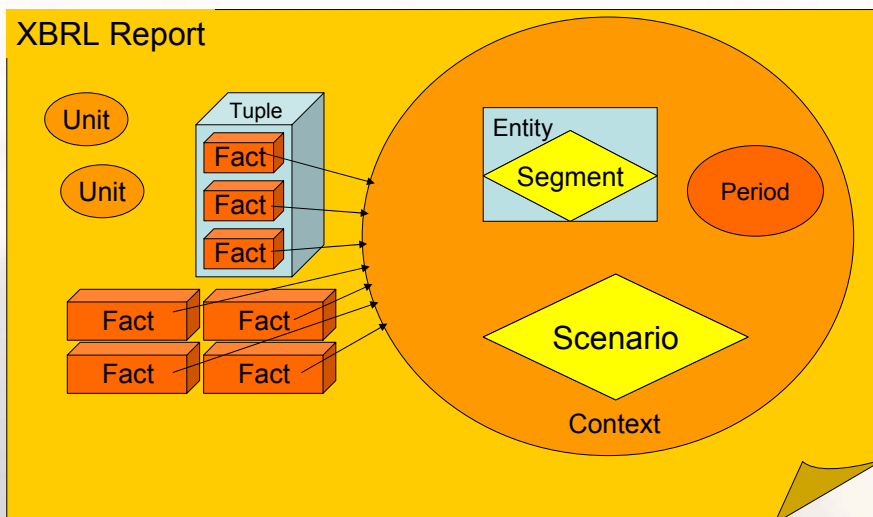


© 2005 XBRL International, All Rights Reserved
www.xbrl.org/Legal

Types of dimensions

- Explicit dimensions
 - You know exactly what are the dimension members
 - There is a finite (manageable) number of members
 - Example: the product dimension
- Typed dimensions
 - You don't know the values, but you know enough to define the members.
 - XML schema aware data, customer codes, latitude and longitude coordinates
 - There is an infinite (unmanageable) number of elements

XBRL Instance: where the information lies



XBRL dimensional taxonomies

- Defined the content of the segment and/or scenario elements
- Allows detection of invalid members combinations
- Explicit dimensions members must be defined
 - Calculations using dimension members
 - Labels for the dimension members
 - Presentation structures of the dimension members
 - References
 - ...
- This sounds familiar to me. What do you think?



© 2005 XBRL International, All Rights Reserved
www.xbrl.org/Legal

Defining dimensional taxonomies

Exhibit 3
Budget Summary Pivot Table by Quarter

Quarters	Department	Product	Data		
			Sales	Profit	
Qtr1	100	A	33,000	10,379	31.5%
		B	66,000	21,000	31.8%
	200	C	145,000	44,700	31.8%
Qtr1 Total			145,000	44,700	31.7%
Qtr2	1	A	36,000	8,000	22.2%
		B	72,000	24,000	33.3%
	2	C	50,400	16,800	33.3%
Qtr2 Total			158,400	48,800	33.3%
Qtr3		A	30,000	8,000	27.0%
Quarterly results...			1,376	31,707	23.0%
			1,185	1,000	84.4%
			100	285	285%
			376	31,707	84.3%

The concepts already exist in existing taxonomies

These are the dimensional elements they MUST be defined in a taxonomy. 2nd step is to define the dimensional elements in a new "template" taxonomy. In that taxonomy we will link the concepts with the dimensions.

These members are part of a explicit domain. 1st step is to define the elements in a new taxonomy. They MAY have references, labels etc. For convenience it is good to create one separate "domain" taxonomy. And one taxonomy per domain

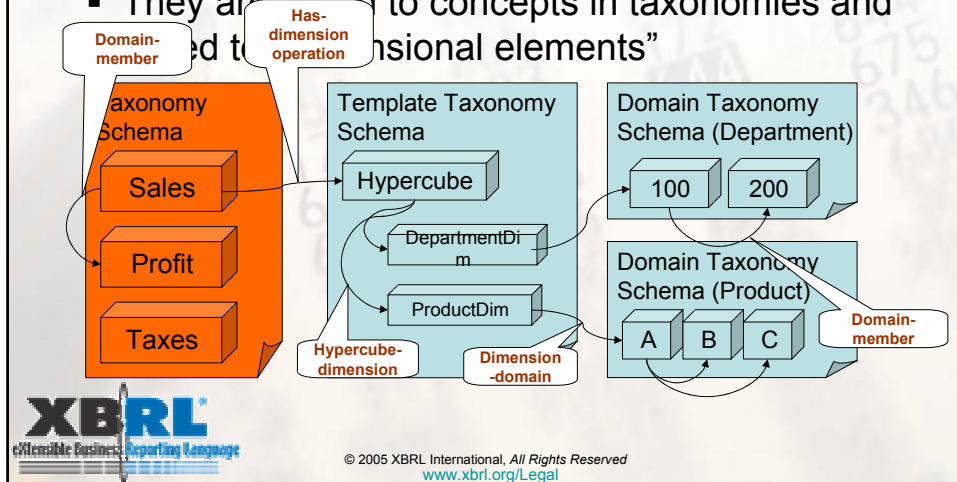
Every row of data contains a dimension member combination associated with the financial concepts. The definition of valid member combinations and what financial concepts are linked with what dimensions is done using "hypercubes"



© 2005 XBRL International, All Rights Reserved
www.xbrl.org/Legal

The hypercube definition

- Hypercubes are concepts not usable in XBRL instances but they exist in taxonomies.
- They are linked to concepts in taxonomies and “dimensional elements”



Hypercube Operations

- Multiple hypercubes MAY be linked to a primary concept
- Boolean algebra drives the hypercubes to primary item relationships
- Operations defined are ALL, ANY, CHOICE and negated versions of those operations.
 - ALL: means all hypercubes MUST be valid
 - ANY: means at least one hypercube MUST be valid
 - CHOICE: means just one hypercube MUST be valid
- It is not legal to combine hypercubes using two different operations.

Example 1:

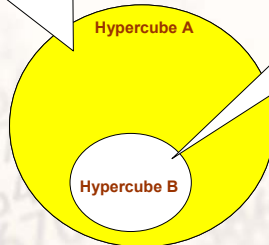
- Two Hypercubes

Sales $-(\text{choice}) \rightarrow A$

Sales $-(\text{choice}) \rightarrow B$

Products {A,B,C} and Department {100,200}

Products {A} and Department {200}



Valid combinations:

Product	Department
A	100
B	100
B	200
C	100
C	200

Invalid combinations:

Product	Department
A	200



© 2005 XBRL International, All Rights Reserved
www.xbrl.org/Legal

Example 2:

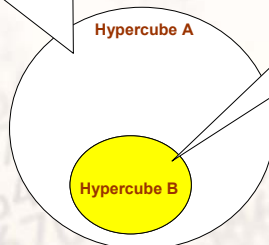
- Two Hypercubes

Sales $-(\text{all}) \rightarrow A$

Sales $-(\text{all}) \rightarrow B$

Products {A,B,C} and Department {100,200}

Products {A} and Department {200}



Valid combinations:

Product	Department
A	200

Invalid combinations:

Product	Department
A	100
B	100
B	200
C	100
C	200



© 2005 XBRL International, All Rights Reserved
www.xbrl.org/Legal

The XBRL Dimensional Specification

- Uses the Definition linkbase
 - Define interim elements needed to group building structures
 - Domain members
 - Dimensions
 - Hypercubes
 - Define member to member relationships to allow applications to know the member role



© 2005 XBRL International, All Rights Reserved
www.xbrl.org/Legal

Conclusion

- “Dimensional Taxonomies” is an XBRL module addition
 - DOES NOT alter the base specification
- That allows internal reporting
 - Based on existing taxonomies
- Helps in the consolidation process
- Helps in real Business Reporting
- Provides input for sophisticated data analysis (e.g. OLAP)
- Provides sophisticated mechanisms to specify valid dimension combinations for any fact
- Supports context validation
- Based on already defined XBRL tools



© 2005 XBRL International, All Rights Reserved
www.xbrl.org/Legal



¿Questions?

