

Overview

This overview is basically brainstorming so that others can contribute to this process.

This prototype is a work in progress toward creating an XBRL instance and related XBRL taxonomies which comply with the Financial Reporting Logical Model being created by the XBRL International Taxonomy Architecture Working Group. The purpose is both to evaluate that logical model and to provide insight as to how well that model works.

Financial Reporting Logical Model (DRAFT)

Here is a PDF printout of a mind map of a DRAFT of that financial reporting logical model:

<http://www.xbrlsite.com/Demos/FRTA/2010-05-19/XBRL%20Conceptual%20Model%20Ver%2013.pdf>

NOTE THAT THIS MODEL WILL CHANGE! The point of this prototype is to test the model to see if it works, how it works, etc. Eventually, the mind map will be instantiated as a UML model which is easier to understand.

XBRL Instance and XBRL Taxonomies

This XBRL instance and the related XBRL taxonomy represents my view on how the logical model should be physically instantiated. (There is a document which explains the logical model semantic meaning to the XBRL syntax.)

<http://www.xbrlsite.com/Demos/FRTA/2010-05-19/company-instance.xml>

If you load that XBRL instance into any XBRL processor, it should validate. (If it does not please let me know, it is likely that I somehow made a mistake.)

The intent is that the XBRL instance represents this financial information (this was generated from the XBRL instance using an XSLT style sheet which transforms the information into XSL-FO which is fed to an XSL-FO processor which outputs this PDF):

<http://www.xbrlsite.com/Demos/FRTA/2010-05-19/company-instance.pdf>

Financial Reporting Logical Model "Info Set"

After the XBRL instance is loaded into an XBRL processor (which includes the loading of all the XBRL taxonomies, see the XBRL instance for the starting point taxonomy), imagine that the XBRL processor puts the DTS together as it is expected to do. Then, imagine that you instantiated what the XBRL processor put together into the form of three files or "info sets". (These could be and probably should be in one file, but I have separated them into three files to help see the pieces.)

First, you have the Financial Information Set Information Groups info set:

http://www.xbrlsite.com/Demos/FRTA/2010-05-19/company-instance_Infoset_InformationGroups.xml

This is a human readable rendering of that file:

http://www.xbrlsite.com/Demos/FRTA/2010-05-19/company-instance_Infoaset_InformationGroups.html

This represents an organization of the XBRL instance information into the individual information groups contained in the XBRL taxonomy.

Second, you have the Measure Relations info set:

http://www.xbrlsite.com/Demos/FRTA/2010-05-19/company-instance_Infoaset_MemberRelations.xml

This HTML file is the same information organized for human presentation:

http://www.xbrlsite.com/Demos/FRTA/2010-05-19/company-instance_Infoaset_MemberRelations.html

The measure relations info set articulates how the measures should be organized; what order and what hierarchy. This comes from the XBRL taxonomy. If you don't like the organization, you can change the XBRL taxonomy which would then change the measure relations.

Third, the Information Groups have an order; meaning that a financial report is not random, the pieces of the report exist within a certain order. I call this ordering "Flow".

http://www.xbrlsite.com/Demos/FRTA/2010-05-19/company-instance_Infoaset_Flow.xml

Here is a human readable rendering:

http://www.xbrlsite.com/Demos/FRTA/2010-05-19/company-instance_Infoaset_Flow.html

The flow looks a lot like the measure relations because it also comes from an XBRL taxonomy. Basically, the flow is constructed by creating a definition linkbase which shows relations between the different hypercubes in the financial report.

If you look through the three info set files, you will notice that the terms in the files correspond to the financial reporting logical model documented in that PDF mind map.

Using the Info Sets

The info set files were created using an XBRL processor for the most part, run through style sheets to convert the terminology of the XBRL processor output to the financial reporting logical model. Basically, the info sets reorganize the XBRL instance and XBRL taxonomy into an easier to use form AFTER the XBRL processor resolves the DTS (Discoverable Taxonomy Set).

An Excel application (a prototype) I created reads the info set files and provides an interface into using the XBRL instance and supporting XBRL taxonomy information. Think of the info set files as collections of information provided by the XBRL processor. You can download the Excel prototype application here:

<http://www.xbrlsite.com/Demos/FRTA/2010-05-19/HypercubeViewer.zip>

This is a screen shot of the main form of the Excel prototype:

The screenshot shows the 'Interactive Information Hypercube Viewer' application. It is divided into three main steps:

- Step 1: Get the information groups within the financial information set.** This section includes an 'Open' button, a 'Financial Information Set' list box containing 'ACME Company', and several 'Extended Links' with URLs. It also has a 'Hypercubes' section listing various information groups.
- Step 2: View the metadata for the selected information group.** This section displays the 'Information Group (Network/Hypercube)' list box with '10002 - Sales Analysis, by Geographic Area' selected. Below this are sections for 'Measures' (listing various fact measures like ReportingEntityMeasure, ConceptMeasure, etc.) and 'Measure Members' (listing ACME company instances).
- Step 3: Build hypercube for selected information group. Rearrange slicers, rows, columns as needed.** This section contains buttons for 'Build/Rebuild Hypercube Structure' and 'Populate Hypercube'. It also features a 'Show trail' checkbox and three main configuration areas: 'Slicers (i.e. measure value same for all facts):' with a list of measures and a 'Move Slicer' button; 'Rows (render in rows):' with a list of measures and a 'Move Row' button; and 'Columns (render in columns):' with a list of measures and a 'Move Col' button. At the bottom of this section are 'Make Slicer', 'Make Row', and 'Make Column' buttons, along with 'Period Starts', 'Period Ends', and a 'Close' button.

The application is a prototype. It does work, but if you press the wrong buttons things can go wrong. This is one path through the application which does work:

1. After opening the Excel spreadsheet, press the button “Get Financial Information Set” to open up the above form.
2. Press the “Open” button in the upper left corner of the form above.
3. Select “ACME Company” in the Financial Information Set list box.
4. Select “10002 – Sales Analysis, by Geographic Area” from the Information Group (Network/Hypercube) list box.
5. Press the “Build/Rebuild Hypercube Structure” button.
6. Press the “Populate Hypercube” button.
7. Press the “Close” button and go look at the data which was retrieved. Compare that data to the PDF of the financial report above.

Your results should look something like this:

	A	B	C	D	E	F
1	gaap:SalesAnalysisByGeographicAreaInformationGroup					
2	Get Financial Information Set					
3	Slices:					
4	frta:ReportingEntityMeasure	ACME (http://www.ACME.com)				
5	frta:ConceptMeasure	gaap:Sales				
6	gaap:LegalEntityMeasure	gaap:ACMECompanyMember				
7	gaap:BusinessSegmentMeasure	gaap:BusinessSegmentsAllDomain				
8						
9						
10		Label	Name	2010-01-01/2010-12-31	2009-01-01/2009-12-31	2008-01-01/2008-12-31
11		Geographic Area [Measure]				
12		Geographic Areas, All [Domain]	gaap:GeographicAreasAllDomain	32,038,000	35,805,000	32,465,000
13		US and Canada Region [Member]	gaap:USAndCanadaRegionMember	10,214,000	12,649,000	10,137,000
14		Europe Region [Member]	gaap:EuropeRegionMember	11,901,000	10,374,000	10,396,000
15		Asia Region [Member]	gaap:AsiaRegionMember	5,639,000	4,371,000	3,210,000
16		Other Regions [Member]	gaap:OtherRegionsMember	4,284,000	8,411,000	8,722,000
17						
18						

Here is a file with renderings for each information group:

http://www.xbrlsite.com/Demos/FRTA/2010-05-19/HypercubeViewer_Output.zip

All the information groups work. You can fiddle with the slicers, rows, and columns to put the information where you desire. Explaining this is beyond the scope of this simple explanation. You are on your own to figure the prototype application out. I am working on making it less buggy and more intuitive to use, but I have a need for all the things on that form at this point.

Other Useful Information

There are lots of other things going on here with this demo, but I will need to provide that later. Realize that you do have these pieces:

Business Rules Validation: http://www.xbrlsite.com/Demos/FRTA/2010-05-19/company-instance_FormulaTrace.html (This basically shows that the computation relations or business rules of the financial report add up properly)

Expression of Business Rules: <http://www.xbrlsite.com/Demos/FRTA/2010-05-19/gaap-formula.xml> (This contains the business rules used for the business rules validation. Note that these business rules can be auto-generated from the information model of the XBRL taxonomy, i.e. the roll ups, the roll forwards, and the hierarchies.)

Human Readable Rendering of Business Rules: <http://www.xbrlsite.com/Demos/FRTA/2010-05-19/gaap-formula.html> (This is a first cut at a way to read the business rules.)

Calculations validation: http://www.xbrlsite.com/Demos/FRTA/2010-05-19/company-instance_calctrace.html (XBRL calculations are another syntax for expressing what amount to business rules.)

RSS Feed: <http://www.xbrlsite.com/Demos/FRTA/2010-05-19/rss.xml> (This RSS feed only contains one file currently, but imagine if you wanted to compare two or maybe 10 XBRL instances. How would you load the all into an application? The application needs to read some sort of format. Rather than users have to load XBRL instances individually and rather than have different software products support different ways to package XBRL instances together for loading, a standard format would be preferable.

The idea of using an RSS feed is from the US SEC's use of RSS for their EDGAR system which was first done on during their Voluntary Filing Program.)

I have to weave all these pieces together to help show what the financial reporting logical should look like, why, and show that it works.

Questions/Ideas/Next Steps

The following changes will be made to this prototype:

1. In my view, the Financial Reporting Logical Model really should be broken into two pieces: a Business Reporting Logical Model and a Financial Reporting Logical Model. Financial reporting is a class of business reporting. The ideas of the Financial Reporting Logical Model can be applied to the more general business reporting domain.
2. In my view, using both extended links and hypercubes to express information groups is not the way to go. Hypercubes have more advantages than extended links. Extended links have their purpose, but they are more related to XBRL syntax than to business or financial reporting semantics. I will evolve this model to make the extended links or XBRL "Networks" disappear, preferring to use unique hypercubes to identify information groups.
3. The Financial Reporting Logical Model seems to be specific measures which are added to the Business Reporting Logical Model which really provides the real infrastructure. What I mean by this is that the Financial Reporting Logical Model should be a set of measures which are required by financial reporting implementations choosing to follow this architecture.