

Straw Man Prototype Implementation of Business Reporting and Financial Reporting Logical Model

This is an overview of a straw man prototype implementation of the **Business Reporting Logical Model** and **Financial Reporting Logical Model** created by the XBRL International Taxonomy Architecture Working Group (TA). I am a member of that working group and am creating this prototype to test the models and otherwise gather information which can be used to determine the best modeling approach.

Business Reporting Logical Model and Financial Reporting Logical Model (Current 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/2010-06-15/ LogicalModels.pdf>

NOTE THAT THIS MODEL WILL CHANGE! Eventually, the mind map will be instantiated as a UML model which is easier to understand.

Overview of XBRL Taxonomies

The following is a summary of the XBRL taxonomies used to implement this prototype:

Taxonomy Name	Purpose	URL
Business Reporting Model (brm)	Provides business reporting building block components and data types	http://www.xbrlsite.com/Demos/FRTA/2010-06-15/brm.xsd
Financial Reporting Model (frm) [CSH: This may not be necessary, could move to brm.]	Provides financial reporting level building blocks.	http://www.xbrlsite.com/Demos/FRTA/2010-06-15/frm.xsd
Financial Reporting Taxonomy Architecture (FRTA)	Provides financial reporting related Measures, Domains, and Members. Uses FRM and BRM.	http://www.xbrlsite.com/Demos/FRTA/2010-06-15/frta.xsd Human readable: http://www.xbrlsite.com/Demos/FRTA/2010-06-15/frta_TreeView.html
Demo GAAP Taxonomy (GAAP)	This is a small GAAP Taxonomy demo which leverages the FRTA.	http://www.xbrlsite.com/Demos/FRTA/2010-06-15/gaap.xsd Human readable: http://www.xbrlsite.com/Demos/FRTA/2010-06-15/gaap_TreeView.html

Taxonomy Name	Purpose	URL
Demo Regulator Taxonomy (Regulator)	This is a small taxonomy which represents what might be implemented by a regulator	I just realized that this would be a very good thing to add to this prototype, but I have not done that yet. To be added in the near future.
Company Extension Taxonomy (Company)	This is a small company extension taxonomy demo which leverages FRTA.	http://www.xbrlsite.com/Demos/FRTA/2010-06-15/company.xsd Human readable: http://www.xbrlsite.com/Demos/FRTA/2010-06-15/company_TreeView.html

The ideas which went into creating these taxonomies above have come from many years of creating XBRL taxonomies and related XBRL instances. These include insights from the US GAAP (particularly their use of “styles” such as [Table]s, [Roll Up], [Roll Forward] and [Hierarchy]; see the [US GAAP Taxonomy Architecture](#)), the IFRS taxonomies, COREP (particularly their use of XBRL Dimensions), FINREP, the Netherlands SBR project, CRAS. Also, information used to create [XBRLS](#) will be used as input.

Mapping Semantics to XBRL Syntax

This link will take you to a document which provides a mapping of the logical model semantics to the actual XBRL implementation (XBRL syntax):

<http://www.xbrlsite.com/Demos/FRTA/2010-06-15/SemanticsToSyntaxMapOfImplementation.pdf>

Processing Model

This is a link to a processing model which can help understand how XBRL is generated and consumed:

<http://www.xbrlsite.com/Demos/FRTA/2010-06-15/ProcessingModelOfImplementation.pdf>

Overview of Initial Use Case (See use cases/test cases to be added in the future below)

This is the initial/base use case which will test this model.

PDF: <http://www.xbrlsite.com/Demos/FRTA/2010-06-15/company-instance.pdf>

Excel: <http://www.xbrlsite.com/Demos/FRTA/2010-06-15/company-instance.xls>

This use case may not seem like much but there are two important things to keep in mind about this use case.

- (1) The pieces in this use case were selected because they are areas which are known to provide needed stresses on the business reporting and financial reporting logical models. The small fragments are gleaned from the more comprehensive use cases below.
- (2) If the business reporting and financial reporting logical models cannot meet these basic use cases, it will certainly not be able to meet a more comprehensive set of use cases.

This is base use case is a very good, comprehensive (more comprehensive than it might appear to the untrained eye) starting point.

Overview of Prototype

This is a quick overview of the straw man prototype. For more detailed information, see the Mapping Semantics to XBRL Syntax above.

Item	Location	Discussion
PDF of Instance Information	http://www.xbrlsite.com/Demos/FRTA/2010-06-15/company-instance.pdf	Helps you understand the XBRL instance information
XBRL instance	http://www.xbrlsite.com/Demos/FRTA/2010-06-15/company-instance.xml	Load that XBRL instance and all the XBRL taxonomies necessary will be loaded.
iXBRL instance "Document of Record"	(COMING SOON, this is a placeholder for now, to be created) http://www.xbrlsite.com/Demos/StateFactBook/StateFactBookiXBRL/StateFactBook-GeneralInfo_iXBRL.html (This is NOT HTML, open the document in a text editor or view source and you will see that this is Inline XBRL, which some call iXBRL)	iXBRL is a good "document of record" format, should one need that. It seems that an iXBRL format is useful in the process of evolving from paper or electronic paper to electronic reporting. iXBRL could, for some, have a role in that evolution. However, iXBRL will not solve the problem of XBRL interoperability, XBRL ease of use, creating consistent XBRL taxonomies or generally making things easier for business users. In my view, iXBRL is a red herring. Others have different views.
Excel version of Instance Information	http://www.xbrlsite.com/Demos/FRTA/2010-06-15/company-instance.xls	Helps you understand the XBRL instance information

Item	Location	Discussion
Vendor Implementation of Logical Model	<p>XBRL Cloud has something which they call a "fact table". That fact table is output by the XBRL Cloud XBRL services. I used that fact table as input to create the info sets below. Here is an example XBRL cloud fact table:</p> <p>http://xbrlcloud.com/demo/frta/XBRLCloud-FactTables-Demo.xml</p> <p>Here is a human readable rendering of the same information:</p> <p>http://xbrlcloud.com/demo/frta/XBRLCloud-FactTables-Demo.html</p>	<p>This is a bit of a "black box" because you need the XBRL Cloud web service or some other XBRL processor to generate something that can be converted to the Info Set below.</p>
Info Set	<p>This is the info set generated from the XBRL Cloud output, processed by a style sheet, and resulting in an info set for the logical model:</p> <p>http://www.xbrlsite.com/Demos/FRTA/2010-06-15/company-instance Infoset FactGroups.xml</p> <p>This is a human readable rendering:</p> <p>http://www.xbrlsite.com/Demos/FRTA/2010-06-15/company-instance Infoset FactGroups.html</p> <p>This is the Measure Relations info set:</p> <p>http://www.xbrlsite.com/Demos/FRTA/2010-06-15/company-instance Infoset MemberRelations.xml</p> <p>Human readable rendering of that:</p> <p>http://www.xbrlsite.com/Demos/FRTA/2010-06-15/company-instance Infoset MemberRelations.html</p> <p>Report Flow Info Set:</p> <p>http://www.xbrlsite.com/Demos/FRTA/2010-06-15/company-instance Infoset Flow.xml</p> <p>Human readable rendering of that:</p> <p>http://www.xbrlsite.com/Demos/FRTA/2010-06-15/company-instance Infoset Flow.html</p>	

Item	Location	Discussion
Instance Creator Prototype	http://www.xbrlsite.com/Demos/FRTA/2010-06-15/InstanceCreator.zip	Allows you to see all the moving pieces when it comes to creating an XBRL instance. This is NOT an example of how an XBRL instance creator should work. It is a way to look at all the moving pieces involved in creating an XBRL instance.
Information Extraction Prototype	http://www.xbrlsite.com/Demos/FRTA/2010-06-15/HypercubeViewer.zip	Allows you to see all the moving pieces when it comes to extracting and using XBRL information. This is NOT an example of how an extraction tool should work. It is a way to look at all the moving pieces involved with extracting, using, comparing, XBRL based information. It also helps see the leverage XBRL provides.

Using the Info Sets

Like I said, the info set files were created using an XBRL processor, run through a style sheet (<http://www.xbrlsite.com/Demos/FRTA/2010-06-15/XBRL-Cloud-FactTable-To-LogicalModel.xsl>) to convert the terminology of the XBRL processor output to the business reporting and 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, <http://www.xbrlsite.com/Demos/FRTA/2010-06-15/HypercubeViewer.zip>) 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.

Here is a screen shot of the prototype Excel application:

Interactive Information Hypercube Viewer

Step 1: Get the Fact Groups within the Financial Information Set.

Open

Financial Information Set:

ACME Company
Sample Company

<http://www.xbrlsite.com/Demos/FRTA/2010-06-15/company-instance.xml>
http://www.xbrlsite.com/Demos/FRTA/2010-06-15/company-instance_InfoSet_FactGroups.xml
http://www.xbrlsite.com/Demos/FRTA/2010-06-15/company-instance_InfoSet_MemberRelations.xml

Networks (Extended Links):

10001 - Sales Analysis, Summary
10002 - Sales Analysis, by Business Segment
10003 - Sales Analysis, by Geographic Area
20000 - Accounting Policies
30000 - Property, Plant, and Equipment, Roll Up by Component
40000 - Roll Forward of Land
50000 - Director Compensation

Hypercubes:

Sales Analysis, Summary [Fact Group]
Sales Analysis, by Business Segment [Fact Group]
Sales Analysis, by Geographic Area [Fact Group]
Accounting Policies [Fact Group]
Property, Plant and Equipment, by Component [Fact Group]
Land Changes [Fact Group]
Director Compensation [Fact Group]

Step 2: View the metadata for the selected Fact Group.

Fact Group (Network/Hypercube):

10001 - Sales Analysis, Summary | Sales Analysis, Summary [Fact Group]
10002 - Sales Analysis, by Business Segment | Sales Analysis, by Business Segment [Fact Group]
10003 - Sales Analysis, by Geographic Area | Sales Analysis, by Geographic Area [Fact Group]
20000 - Accounting Policies | Accounting Policies [Fact Group]
30000 - Property, Plant, and Equipment, Roll Up by Component | Property, Plant, and Equipment, Roll Up by Component [Fact Group]
40000 - Roll Forward of Land | Land Changes [Fact Group]
50000 - Director Compensation | Director Compensation [Fact Group]

gaap:SalesAnalysisSummaryFactGroup

Measures

brm:ConceptMeasure
brm:ReportingEntityMeasure
brm:CalendarTimeMeasure
frta:LegalEntityMeasure
frta:BusinessSegmentMeasure
frta:GeographicAreaMeasure

Measure Values (Members)

Step 3: Build hypercube for selected Fact Group. Rearrange slicers, rows, columns as desired.

Build/Rebuild Hypercube Structure

Populate Hypercube

☒ Show trail

Slicers (i.e. measure value same for all facts):

brm:ReportingEntityMeasure (On 3 of 3 facts)
frta:LegalEntityMeasure (On 3 of 3 facts)
frta:BusinessSegmentMeasure (On 3 of 3 facts)
frta:GeographicAreaMeasure (On 3 of 3 facts)

Move Slicer

Rows (render in rows):

brm:ConceptMeasure

Move Row

Columns (render in columns):

brm:CalendarTimeMeasure (On 1 of 3 facts)

Move Col

Temp:

Make Slicer

Make Row

Make Column

Period Start:

Period End:

Close

RSS: <http://www.xbrlsite.com/Demos/FRTA/2010-06-15/rss.xml>

This is one path through the application:

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	Get Financial Information Set	Network: 10003 - Sales Analysis, by Geographic Area				
2		Fact Group: gaap:SalesAnalysisByGeographicAreaFactGroup				
3		Slices:				
4	brm:ConceptMeasure	gaap:Sales				
5	brm:ReportingEntityMeasure	ACME (http://www.ACME.com)				
6	frta:LegalEntityMeasure	company:ACMECompanyMember				
7	frta:BusinessSegmentMeasure	frta: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]	frta:GeographicAreasAllDomain	32,038,000	35,805,000	32,465,000
13		US and Canada Region [Member]	frta:USAndCanadaRegionMember	10,214,000	12,649,000	10,137,000
14		Europe Region [Member]	frta:EuropeRegionMember	11,901,000	10,374,000	10,396,000
15		Asia Region [Member]	frta:AsiaRegionMember	5,639,000	4,371,000	3,210,000
16		Other Regions [Member]	frta:OtherRegionsMember	4,284,000	8,411,000	8,722,000
17						

Here is a file with renderings for each Fact Groups:

http://www.xbrlsite.com/Demos/FRTA/2010-06-15/company-instance_Extracted.xls

All the Fact 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.

Use Cases/Test Cases To Be Added

This is the initial base use case which will test this model.

PDF: <http://www.xbrlsite.com/Demos/FRTA/2010-06-15/company-instance.pdf>

Excel: <http://www.xbrlsite.com/Demos/FRTA/2010-06-15/company-instance.xls>

This use case may not seem like much but there are two important things to keep in mind about this use case. The pieces in this use case were selected because they are areas which are known to provide needed stresses on the models. The small fragments are gleaned from the more comprehensive use cases below. Further, if the model cannot meet these small tests, it surely will not survive within a production environment.

When this initial base set of use cases works; the use cases will be expanded to include a known set of about 28 different business use cases which have been accumulated over 10 years of creating financial reporting taxonomies including the USFRTF Patterns Document and the XBRLS Business use cases. See:

http://xbrlsite.com/XBRL_Site/Learning_about_XBRL.html

Once those individual 28 use cases are created, then a comprehensive example of all 28 business use cases within one financial report will be created similar to what I call "the comprehensive example. See this URL for a previous version of the comprehensive example:

<http://www.xbrlsite.com/examples/comprehensiveexample/2008-04-18/>

Finally, a "repository" if financial reports will be created to test comparability between XBRL instances. See this repository as an example:

<http://www.xbrlsite.com/Examples/SimpleComparison/rss.xml>

It is these use cases which will stress the business reporting and financial reporting logical models and provide input which shows what works, what does now, how well things work and otherwise evaluate these models. Years of experience creating XBRL taxonomies has shown that these test cover more than 99% of everything which has ever been thrown an XBRL from the perspective of financial reporting.

Key Principles

- Extension of XBRL taxonomies is allowed (i.e. not required)
- Enable the unambiguous expression of meaning.
- A sound model can yield a good and flexibly "document oriented" view of information.
- Everything should be explicit (nothing should be implicit)
- Have only one way of expressing something (i.e. no unnecessary options or features)
- Focus on business semantics, not XBRL syntax
- Make XBRL usable by business users (i.e. without involvement of any technical people).

Key Requirements

ID	Requirement
UC01	Viewing a financial report, its concepts, relations and business rules (including extensions).
UC02	Verification of the completeness, correctness, consistency (data integrity) of an individual financial report and its concepts, relations, and business rules.
UC03	Time series comparison across financial reports for different periods (automated or manual).
UC04	Comparison between two or more financial reports (automated or manual).
UC05	Creation of financial report (automated or manual).

