

Mastering XBRL-based Digital Financial Reporting

Incremental steps to understanding a proven and effective approach to implementing XBRL-based accounting, reporting, auditing, and analysis

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“Practice does not make perfect. Only perfect practice makes perfect.” *Vince Lombardi*¹

Executive summary:

- Getting your head around XBRL-based accounting, reporting, auditing, and analysis can be mindboggling due to misinformation, myths, poorly implemented software, poorly created XBRL taxonomies, poorly created XBRL instances, lack of understanding of important background information, etc.
- But understanding XBRL-based reporting does not have to be hard.
- This document provides a number of incremental steps that will turn the reader into an XBRL Jedi Master!
- This document is a first draft.
- Ultimately, all the information referenced by this document will be consolidated into one document. The information will be better summarized and synthesized.
- Stay tuned!

¹ BrainyQuote, Vince Lombardi, https://www.brainyquote.com/quotes/vince_lombardi_138158

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Understanding XBRL-based accounting, reporting, auditing, and analysis does not need to be a struggle. This document helps you sift through the myths, misinformation, poorly created XBRL taxonomies, poorly created XBRL instances, and helps you understand how to effectively use XBRL.

None of this is based on opinion, rather this information is based on proven best practices, rigorous testing, sound engineering, and empirical evidence that you can get your head around.

This document breaks your path to understanding into small, bite-sized incremental steps that you can get your head around.

Currently I am in my brainstorming phase but the path is emerging. This is a first draft. In addition to a document, a series of videos will be created that will assist in the learning process². Note that some of these representations are the never version, others are older versions that will be reconfigured so that the pieces fit together better. If you have not done so, it is strongly suggested that you read the document *Artificial Intelligence and Knowledge Engineering in a Nutshell*³ prior to proceeding further in this document. That document has critical background information necessary for understanding this document.

Accounting Equation Representation⁴

The first step in your journey is a simple, basic, easy to get your head around logical system. Every accountant and most business professionals understand the **Accounting Equation**. The objective of this iteration is to introduce you to the notion of a logical system, help you understand what it takes for a logical system to be properly functioning, and teach you some basic information about representing information using the XBRL technical syntax.

To perform this step, read this document:

<http://xbrlsite.azurewebsites.net/2020/core/master-ae/Documentation.pdf>

Use these files:

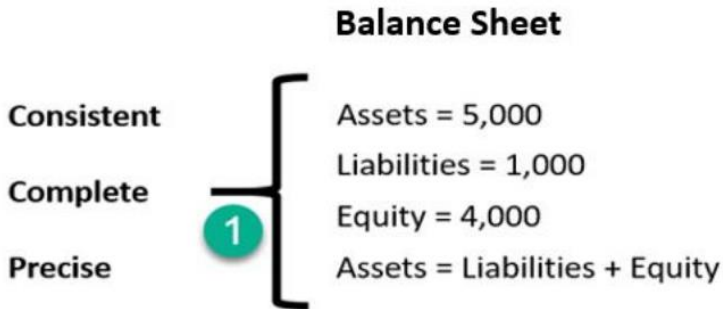
<http://xbrlsite.azurewebsites.net/2020/core/master-ae/>

The primary takeaway from this example an understanding of this simple, basic properly functioning logical system and why it is considered to be properly functioning:

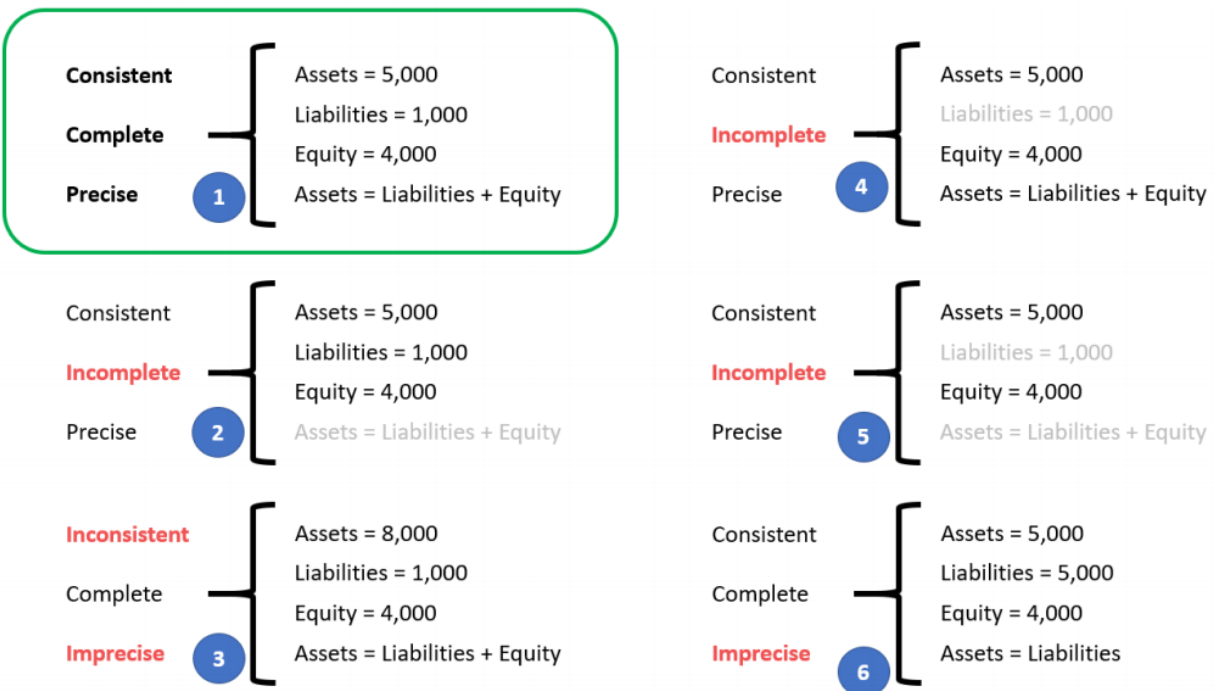
² YouTube.com, Mastering XBRL-based Digital Financial Reporting,
<https://www.youtube.com/playlist?list=PLqMZRUzQ64B44jXcayBd2jIZp8o2ei6is>

³ Charles Hoffman, CPA, *Artificial Intelligence and Knowledge Engineering in a Nutshell*,
<http://xbrlsite.azurewebsites.net/2019/Library/KnowledgeEngineeringInNutShell.pdf>

⁴ Accounting Equation Representation, <http://xbrlsite.azurewebsites.net/2020/core/master-ae/>



A secondary takeaway is all the things that can cause a logical system to be inconsistent, incomplete, and/or imprecise:



SFAC 6 Elements of Financial Statements Representation⁵

While the accounting equation example is relatively easy to get your head around because it only has three terms (assets, liabilities, equity), one assertion, (assets = liabilities + equity), one structure (balance sheet), and a handful of other logical statements; the FASB's **SFAC 6**

⁵ SFAC 6 Elements of Financial Statements Representation, <http://xbrlsite.azurewebsites.net/2020/core/master-sfac6/>

Elements of Financial Statements representation is still relatively small, but expands on the accounting equation enough to make some new points and point out additional details.

To perform this step, read this document:

<http://xbrlsite.azurewebsites.net/2020/core/master-sfac6/Documentation.pdf>

Use these files:

<http://xbrlsite.azurewebsites.net/2020/core/master-sfac6/>

The primary takeaway from this example is an increased knowledge of the notion of the terms, associations, assertions (a.k.a. rules), structures, and facts that make up a logical system and additional insight as to what you have to do to keep such a logical system properly functioning.

Assets = 3,500^{T1}; 0^{T0}

Liabilities = 0^{T1}; 0^{T0}

Equity = 3,500^{T1}; 0^{T0}

Revenues = 7,000

Expenses = 3,000

Gains = 1,000

Losses = 2,000

Comprehensive income = 3,000

Investments by Owners = 1,000

Distributions to Owners = 500

Assets = Liabilities + Equity

Comprehensive Income =
Revenues - Expenses + Gains - Losses

Equity^{T1} = Equity^{T0} + Comprehensive
Income^{P1} + Investments by Owners^{P1} -
Distributions to Owners^{P1}

Balance Sheet

Balance Sheet [Abstract]	Period [Axis]	
	2020-12-31	2019-12-31
Assets	3,500	0
Liabilities	0	0
Equity	3,500	0

Income Statement

Comprehensive Income Statement [Abstract]	Period [Axis]	
	2020-01-01 - 2020-12-31	
Comprehensive Income [Roll Up]		
Revenues	7,000	
(Expenses)	(3,000)	
Gains	1,000	
(Losses)	(2,000)	
Comprehensive Income	3,000	

Changes in Equity

Changes in Equity [Abstract]	Period [Axis]	
	2020-01-01 - 2020-12-31	
Equity [Roll Forward]		
Equity, Beginning	0	
Comprehensive Income	3,000	
Investments by Owners	1,000	
(Distributions to Owners)	(500)	
Equity, Ending	3,500	

Comprehensive Income Statement [Abstract]	Period [Axis]	
	2020-01-01 - 2020-12-31	
Comprehensive Income [Roll Up]		
Revenues	7,000	
(Expenses)	(3,000)	
Gains	1,000	
(Losses)	(2,000)	
Comprehensive Income	3,000	

Changes in Equity [Abstract]	Period [Axis]	
	2020-01-01 - 2020-12-31	
Equity [Roll Forward]		
Equity, Beginning	0	
Comprehensive Income	3,000	
Investments by Owners	1,000	
(Distributions to Owners)	(500)	
Equity, Ending	3,500	

A secondary takeaway is an expanding understanding of structures, how structures are used to adapt the models of the reports of economic entities to the allowed intermediate components (i.e. subtotals) of financial reports. Also, the important notion of articulation is introduced.

SFAC 6 Elements of Financial Statements PLUS Representation⁶

In the initial representation of SFAC 6 Elements of Financial Statements, I represented ONLY the for-profit elements in order to keep the example as small as possible. It is worth while to provide another representation where the for-profit and the not-for-profit representations are combined because this really helps to understand the notion of different structures. And thus, this SFAC 6 Elements of Financial Statements PLUS representation.

To perform this step, read this document:

<http://xbrlsite.azurewebsites.net/2020/core/master-sfac6plus/Documentation.pdf>

Use these files:

<http://xbrlsite.azurewebsites.net/2020/core/master-sfac6plus/>

The primary takeaway from this example is an increased knowledge of the notion of the structures and how they are used. For-profit financial reporting and not-for-profit financial reporting use different “models”. Those different models can be represented using different structures to make statements about the associations between terms, assertions, etc.

Common Elements of Financial Statements Representation⁷

The SFAC 6 *Elements of Financial Statements* representation was still quite small but was still easy to get your head around. However, you cannot really represent a complete set of financial statements with that example.

The **Common Elements of Financial Statements** representation adds 16 additional concepts to the 10 provided by SFAC 6 and allows for all four core financial statements to be represented. It also adds a number of additional structures, additional rules, and you can now begin to get your head around how to properly represent a financial statement using the XBRL technical syntax, Prolog, or any other technical syntax that is the current fad, trend, or preference. Whatever syntax you use, you see what has to be represented to keep the financial report a properly functioning logical system.

⁶ SFAC 6 Elements of Financial Statements Representation, <http://xbrlsite.azurewebsites.net/2020/core/master-sfac6/>

⁷ SFAC 6 Elements of Financial Statements Representation, <http://xbrlsite.azurewebsites.net/2020/core/master-sfac6/>

To perform this step, read this document:

<http://xbrlsite.azurewebsites.net/2020/core/master-common/CommonElementsOfFinancialStatement.pdf>

Use these files:

<http://xbrlsite.azurewebsites.net/2020/core/master-common/>

The primary takeaway from this representation is an appreciation for the number of mathematical relations that exist within a financial report and the rules that are necessary to make sure such reports are properly functioning logical systems:

Balance Sheet [Line Items]			Period [Axis]	
			2020-12-31	2019-12-31
Assets [Roll Up]				
Current Assets			500	0
Noncurrent Assets			3,000	0
	Assets		3,500	0
Liabilities and Equity [Roll Up]				
Liabilities [Roll Up]				
Current Liabilities			0	0
Noncurrent Liabilities			0	0
	Liabilities		0	0
Equity [Roll Up]				
Equity Attributable To Controlling Interests			3,000	0
Equity Attributable to Noncontrolling Interests			500	0
	Equity		3,500	0
	Liabilities and Equity		3,500	0

Cash Flow [Line Items]		Period [Axis]
		2020-01-01 - 2020-12-31
Net Cash Flow [Roll Up]		
Net Cash Flow Operating Activities		1,500
Net Cash Flow Investing Activities		1,000
Net Cash Flow Financing Activities		1,000
	Net Cash Flow	3,500

Changes in Equity [Line Items]		Period [Axis]
		2020-01-01 - 2020-12-31
Changes in Equity [Roll Forward]		
Equity, Beginning Balance		0
Comprehensive Income		3,000
Investments by Owners		1,000
(Distributions to Owners)		(500)
	Equity, Ending Balance	3,500

Comprehensive Income Statement [Line Items]		Period [Axis]
		2020-01-01 - 2020-12-31
Comprehensive Income [Roll Up]		
Revenues		7,000
(Expenses)		(3,000)
Gains		1,000
(Losses)		(2,000)
	Comprehensive Income	3,000

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id	satisfied	message
Arithmetic_BS01 (evaluation 1)	satisfied	\$Assets=0 = (\$Liabilities=0 + \$Equity=0)
Arithmetic_BS01 (evaluation 2)	satisfied	\$Assets=3500 = (\$Liabilities=0 + \$Equity=3500)
Arithmetic_BS02 (evaluation 1)	satisfied	\$Assets=0 = (\$CurrentAssets=0 + \$NoncurrentAssets=0)
Arithmetic_BS02 (evaluation 2)	satisfied	\$Assets=3500 = (\$CurrentAssets=500 + \$NoncurrentAssets=3000)
Arithmetic_BS03 (evaluation 1)	satisfied	\$Liabilities=0 = (\$CurrentLiabilities=0 + \$NoncurrentLiabilities=0)
Arithmetic_BS03 (evaluation 2)	satisfied	\$Liabilities=0 = (\$CurrentLiabilities=0 + \$NoncurrentLiabilities=0)
Arithmetic_BS04 (evaluation 1)	satisfied	\$Equity=0 = (\$EquityAttributableToControllingInterests=0 + \$EquityAttributableToNoncontrollingInterests=0)
Arithmetic_BS04 (evaluation 2)	satisfied	\$Equity=3500 = (\$EquityAttributableToControllingInterests=3000 + \$EquityAttributableToNoncontrollingInterests=500)
Arithmetic_CF01 (evaluation 1)	satisfied	\$NetCashFlow=3500 = (\$NetCashFlowOperatingActivities=1500 + \$NetCashFlowFinancingActivities=1000 + \$NetCashFlowInvestingActivities=1000)
Arithmetic_IS01 (evaluation 1)	satisfied	\$ComprehensiveIncome=3000 = (\$Revenues=7000 - \$Expenses=3000 + \$Gains=1000 - \$Losses=2000)
Arithmetic_IS02 (evaluation 1)	satisfied	\$ComprehensiveIncome=3000 = (\$IncomeFromNormalActivitiesOfEntity=2000 + \$IncomeFromPeripheralOrIncidentalTransactionsOfEntity=1000)
Arithmetic_IS03 (evaluation 1)	satisfied	\$ComprehensiveIncome=3000 = (\$NetIncome=3000 + \$OtherComprehensiveIncome=0)
Arithmetic_NA01 (evaluation 1)	satisfied	\$NetAssets=3500 = (\$Assets=3500 - \$Liabilities=0)
Arithmetic_NA01 (evaluation 2)	satisfied	\$NetAssets=0 = (\$Assets=0 - \$Liabilities=0)
RollForward_CF01 (evaluation 1)	satisfied	\$Assets_BalanceStart=0 + \$NetCashFlow=3500 = \$Assets_BalanceEnd=3500
RollForward_SHE01 (evaluation 1)	satisfied	\$Equity_BalanceStart=0 + \$ComprehensiveIncome=3000 + \$InvestmentsByOwners=1000 - \$DistributionsToOwners=500 = \$Equity_BalanceEnd=3500
CONSISTENCY_AccountingEquation (evaluation 1)	satisfied	\$Assets=0 = (\$Liabilities=0 + \$Equity=0)
CONSISTENCY_AccountingEquation (evaluation 2)	satisfied	\$Assets=3500 = (\$Liabilities=0 + \$Equity=3500)
CONSISTENCY_SFAC6_ElementsOfFinancialStatement (evaluation 1)	satisfied	0 = ((\$Equity_BalanceStart=0 + ((\$Revenues=7000 - \$Expenses=3000) + (\$Gains=1000 - \$Losses=2000)) + (\$InvestmentsByOwners=1000 - \$DistributionsToOwners=500)) + (\$Liabilities_BalanceEnd=0 - \$Assets_BalanceEnd=3500))

Secondly, you should be becoming more comfortable with reviewing XBRL-based financial reports using tools such as XBRL Cloud's Evidence Package⁸ or other quality tools of your choosing:

Rendering

Component: (Network and Table)

Network01-Balance Sheet
<http://www.xbrlsite.com/common/rola/BalanceSheet>

TableBalance Sheet [Hypercube]

Slices (applies to each fact value in each table cell)

Reporting Entity (Axis)GH294400TORPUOL6531 (<http://standards.irs.org/iso/17442/>)

Balance Sheet [Line Items]		Period (Axis)	
		2020-12-31	2019-12-31
Assets [Roll Up]			
Current Assets		300	0
Noncurrent Assets		3,200	0
	Assets	3,500	0
Liabilities and Equity [Roll Up]			
Liabilities [Roll Up]			
Current Liabilities		0	0
Noncurrent Liabilities		0	0
	Liabilities	0	0
Equity [Roll Up]			
Equity Attributable To Controlling Interests		3,000	0
Equity Attributable To Noncontrolling Interests		500	0
	Equity	3,500	0
	Liabilities and Equity	3,500	0

Report Element Properties

Report Standard LabelNoncurrent Liabilities

Documentation

Report Element ClassConcept

Prefix (From Taxonomy)common

Balance TypeCredit

Period TypeAs Of (instant)

Data TypeMonetary (xbrl:monetaryItemType)

Namecommon:NoncurrentLiabilities

IDcommon_NoncurrentLiabilities

Labels of Report Element

From	Role	Label	Lang
common	Standard label	Noncurrent Liabilities	en

References of Report Element

No references found for this report element

⁸ XBRL Cloud Evidence Package, http://xbrlsite.azurewebsites.net/2020/core/master-common/evidence-package/contents/index.html#Rendering-BalanceSheet-common_BalanceSheetHypercube.html

The accounting equation, SFAC 6, and common elements of a financial report are good starting points but they do not contain all of the logical information patterns, particularly the mathematical relations that you would find in a real financial report. The proof representation builds on the prior three examples by expanding them to include 100% of all the logical information patterns that you will ever run across within a financial report.

<http://xbrlsite.azurewebsites.net/2020/core/master-proof/Proof.pdf>

<http://xbrlsite.azurewebsites.net/2020/core/master-proof/>

The diagram illustrates the flow of data from the Balance Sheet to the Income Statement and then to the Variance Analysis. It includes several tables and formulas:

Balance Sheet (Arithmetic Expression)

Balance Sheet (Arithmetic Expression)	2020-12-31	2019-12-31
Assets	3,500	0
Liabilities	0	0
Equity	3,500	0

Formulas:

- $\text{Assets} = (\text{Liabilities} + \text{Equity})$
- $\text{Assets} = 3500 = (\text{Liabilities} = 0 + \text{Equity} = 3500)$

Changes in Equity (Roll Forward)

Changes in Equity (Roll Forward)	2019-01-01	2019-12-31
Equity, Beginning Balance	0	0
Comprehensive Income		3,000
Investments by Owners		3,000
Distributions to Owners		(2,500)
Equity, Ending Balance		3,500

Formulas:

- $\text{Equity_BalanceStart} = 0 = (\text{ComprehensiveIncome} = 3000 + \text{InvestmentsByOwners} = 3000 - \text{DistributionsToOwners} = 500 = \text{Equity_BalanceEnd} = 3500)$

Comprehensive Income Statement (Line Items)

Comprehensive Income Statement (Line Items)	2019-01-01	2019-12-31
Revenues		7,000
Expenses		(3,000)
Gains		3,000
Losses		(2,000)
Comprehensive Income		3,000

Formulas:

- $\text{ComprehensiveIncome} = 3000 = (\text{Revenues} = 7000 - \text{Expenses} = 3000 = \text{Gains} = 3000 - \text{Losses} = 2000)$

Variance Analysis (Roll Up)

Variance Analysis (Roll Up)	Reported (Member)	Variance (Member)	Actual (Member)	
Revenues		6,000	1,000	7,000
Expenses		(2,000)	(1,000)	(3,000)
Gains		750	250	1,000
Losses		(1,000)	(1,000)	(2,000)
Comprehensive Income		3,750	(750)	3,000

Formulas:

- $\text{ComprehensiveIncome} = 3000 = (\text{Revenues} = 7000 - \text{Expenses} = 3000 = \text{Gains} = 1000 - \text{Losses} = 2000)$

Diagram Flow:

- Arrows show the flow of data from the Balance Sheet to the Changes in Equity table.
- Arrows show the flow of data from the Changes in Equity table to the Comprehensive Income Statement table.
- Arrows show the flow of data from the Comprehensive Income Statement table to the Variance Analysis table.

⁹ Proof Representation, <http://xbrlsite.azurewebsites.net/2020/core/master-proof/>

report and (b) understanding that that software application generated the entire proof representation by pressing one button. While you do need to represent information using the XBRL Formula syntax, you don't need to understand that underlying syntax because software hides that from you. For example, what is hard about this interface:

Key	RuleCode	Rule	Sequence	Network	InstanceConcept
1	SHE01	\$Equity_BalanceStart + \$ComprehensiveIncome + \$InvestmentsByOwners - \$DistributionsToOwners = \$Equity_BalanceEnd		1 ChangesInEquity	common:Equity

Key	VariableName	Sequence	Flag	Click to Add
4	common:DistributionsToOwners		<input type="checkbox"/>	
3	common:InvestmentsByOwners		<input type="checkbox"/>	
2	common:ComprehensiveIncome		<input type="checkbox"/>	
1	common:Equity		<input type="checkbox"/>	
*	(New)		<input type="checkbox"/>	

The final takeaway from the proof representation is the notion that nothing about this process can be a black box. Professional accountants making use of software need to be able to understand everything that is going on via properly implemented explanation and justification mechanisms.

Trial Balance Representation¹⁰

The trial balance representation is an example of what an internal financial report might look like. This representation uses the foundational keystones of the prior examples, expands the examples to include common financial report line items, provides an accounting roll forward for every balance sheet account, represents a trial balance through which all transactions will pass for the financial statement. Effectively, this representation lets you work back from the summary information in say a balance sheet, to the subitems in a disclosure, through the roll forward of each balance sheet account, and then to the trial balance transaction that would contain journal entries.

To perform this step, read this document:

<http://xbrlsite.azurewebsites.net/2018/RoboticFinance/TrialBalanceToReport.pdf>

Use these files:

<http://xbrlsite.azurewebsites.net/2019/core/core-trialbalance/>

The primary takeaway from this representation is an understanding of how information must be represented in XBRL to keep the logical system working correctly. Accounting is a double entry mechanism. Every transaction impacts two roll forward.

¹⁰ Trial Balance Representation, <http://xbrlsite.azurewebsites.net/2019/core/core-trialbalance/>

Cash and Cash Equivalents [Roll Forward]	Period [Axis]
	2018-01-01 - 2018-12-31
Cash and Cash Equivalents [Roll Forward]	
Cash and Cash Equivalents, Beginning Balance	3,000
Collection of Receivables	3,000
Payment of Accounts Payable	(2,000)
Additional Long-term Borrowings	6,000
Repayment of Long-term Borrowings	(1,000)
Capital Additions of Property, Plant and Equipment	(5,000)
Proceeds from Sale of Property, Plant, and Equipment	0
Cash and Cash Equivalents, Ending Balance	4,000

A secondary takeaway is a realization that Inline XBRL is really more work. Have you ever considered that it is possible for an automated process to generate a very effective presentation of information?

Balance Sheet Roll Ups

	As of December 31, 2018	As of December 31, 2017
<i>(in US Dollars)</i>		
ASSETS		
Current Assets:		
Cash and cash equivalents	\$ 4,000	\$ 3,000
Receivables	2,000	1,000
Inventories	1,000	1,000
Total current assets	7,000	5,000
Noncurrent Assets:		
Property, plant, and equipment	6,000	1,000
Total noncurrent assets	6,000	1,000
Total assets	\$ 13,000	\$ 6,000
LIABILITIES AND EQUITY		
LIABILITIES		
Current Liabilities:		
Accounts payable	\$ 1,000	\$ 1,000
Total current liabilities	1,000	1,000
Noncurrent Liabilities:		
Long-term debt	6,000	1,000
Total noncurrent liabilities	6,000	1,000
Total liabilities	7,000	2,000
EQUITY		
Retained earnings	\$ 6,000	\$ 4,000
Total equity	6,000	4,000
Total liabilities and equity	\$ 13,000	\$ 6,000

Perhaps autogenerated presentations are not pixel perfect enough for fancy external financial reports today, but ultimately, they will be.

Trial Balance Plus Journal Entries Representation¹¹

The trial balance plus journal entries representation uses the trial balance as a base but then backfills and adds journal entries to the XBRL instance and XBRL taxonomy and then connects them directly to the financial report. Think drill down from summarized information all the way to the journal entry.

To perform this step, read this document (web page):

<http://xbrlsite.azurewebsites.net/2019/core/core-auditchain/>

Use these files:

<http://xbrlsite.azurewebsites.net/2019/core/core-journal/>

Imagine having the capability to drill down from a line item on the balance sheet all the way to every journal entry using a global standard format. Well, you really don't need to imagine it; you can experience it for yourself:

The screenshot displays an XBRL viewer interface. The main window shows a 'Balance Sheet' for the period 2018-12-31. The 'Inventories' line item is highlighted in yellow. A 'Report Element Properties' window is open, showing a list of fragments containing 'Inventories'. The list includes:

- 1110 - Statement - Balance Sheet ♦ Implied [Table]
- 2230 - Disclosure - Inventories Roll Forward ♦ Implied [Table]
- 3230 - Disclosure - Inventories Subclassifications ♦ Implied [Table]
- 8101 - Support - Trial Balance ♦ Implied [Table]
- 9000 - Support - Class Associations ♦ Implied [Table]

The main window also shows a table with the following data:

	2018-12-31	2017-12-31
Assets [Roll Up]		
Current Assets [Roll Up]		
Cash and Cash Equivalents	4,000	3,000
Receivables	2,000	1,000
Inventories	1,000	1,000
Current Assets	7,000	5,000
Noncurrent Assets [Roll Up]		
Property, Plant and Equipment	6,000	1,000

¹¹ Trial Balance Plus Journal Entries Representation, <http://xbrlsite.azurewebsites.net/2019/core/core-journal/>

The XBRL Cloud evidence package does not support drilldown because that is a static representation. But the Pesseract working proof of concept has a dynamic interface and does let you drill down four different levels. The last level to the actual journal entry is not standard off-the-shelf functionality because of the format of the journal entries. But, drill down to that level can be implemented because 100% of the logic exists within the report.

The primary takeaway is an understanding of what is necessary to implement drilldown and the notion of roll forward transaction codes.

A secondary takeaway is the notion of type-subtype relations and how to control where concepts are used within structures and within specific relations within a structure. Basically, this relates to the proper use of concepts.

Mini Financial Reporting Scheme Representation¹²

The Mini Financial Reporting Scheme is a rather small financial reporting scheme represented using modern approaches such as XBRL. The reporting scheme represents about 30 disclosures and covers most of the information model patterns but not all. Here is information for this representation:

<http://xbrlsite.azurewebsites.net/2019/Prototype/mini/documentation/Home.html>

<http://xbrlsite.azurewebsites.net/2019/Prototype/mini/documentation/Index.html>

<http://xbrlsite-app.azurewebsites.net/Repository2/Reports.aspx>

The primary takeaway from this representation is the notion of a dashboard of information about any inconsistencies that all the reports in an entire repository might have and how that helps you (a) get XBRL taxonomies created correctly, (b) get regulators to specify disclosure requirements in a machine-readable formats and (c) why it is the case that the XBRL taxonomy information and machine-readable disclosure rules are directly correlated to how usable (i.e. extractable) information is from XBRL-based financial reports.

¹² Mini Financial Reporting Scheme, <http://xbrlsite.azurewebsites.net/2019/Prototype/mini/documentation/Home.html>

Validation Dashboard (MINI Repository)

The following is a summary of validation results for each report submitted to this information repository:

Legal Entity Identifier	Economic Entity Name	View Report	XBRL Validation	Model Structure	Type/Class Relations	FAC	Disclosure Mechanics	Reporting Checklist
10810137d58f76b84aaa	Sample Company	Info	Success	Success	Success	Success	Success	Success
20710066d58f26b84bbb	Sample Company 2	Info	Success	Success	Success	Success	Success	Success
30710066d58f26b84ccc	Sample Company 3	Info	Success	Success	Success	Success	Success	Success
40710066d58f26b84ddd	Sample Company 4	Info	Success	Success	Success	Success	Success	Success
50710066d58f26b84eee	Sample Company 5	Info	Success	Success	Success	Success	Success	Success
60710066d58f26b84fff	Sample Variability Company 6	Info	Success	Warning!	Warning!	Warning!	Warning!	Warning!

XASB Financial Reporting Scheme Representation¹³

The XASB Financial Reporting Scheme is a little larger financial reporting scheme and also represents a modern approach to representing a financial reporting scheme. This financial reporting scheme does contain 100% of the information models that you would ever run across in a financial report.

<http://xbrlsite.azurewebsites.net/2020/reporting-scheme/xasb/documentation/Home.html>

<http://xbrlsite.azurewebsites.net/2020/reporting-scheme/xasb/documentation/Index.html>

The primary takeaway from the XASB financial reporting scheme is the notion of profiles to differentiate one reporting scheme from another where necessary but also the idea of one general implementation profile for XBRL-based financial reports. Why does every regulator do things differently and usually make implementation mistakes in the process? Something like the Standard Business Report Model (SBRM) should be followed consistently by all regulators unless there are specific compelling reasons not to follow global standard best practices. Ignorance that you should follow global best practices is not a good reason.

¹³ XASB Financial Reporting Scheme, <http://xbrlsite.azurewebsites.net/2020/reporting-scheme/xasb/documentation/Home.html>

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id	satisfied	message
ASSERTION_GAAP_Equality_BA-Part-1_BalanceSheetFoots (evaluation 1)	satisfied	\$VARIABLE_A=12000000 = \$VARIABLE_B=12000000
ASSERTION_GAAP_Equality_BA-Part-1_BalanceSheetFoots (evaluation 2)	satisfied	\$VARIABLE_A=10000000 = \$VARIABLE_B=10000000
FAC_BS1_BalanceSheetBalances (evaluation 1)	satisfied	\$Assets=12000000 = \$LiabilitiesAndEquity=12000000
FAC_BS1_BalanceSheetBalances (evaluation 2)	satisfied	\$Assets=10000000 = \$LiabilitiesAndEquity=10000000
FAC_BS2_AssetsEqualsCurrentPlusNoncurrentAssets (evaluation 1)	satisfied	\$Assets=12000000 = \$AssetsCurrent=5000000 + \$AssetsNoncurrent=7000000
FAC_BS2_AssetsEqualsCurrentPlusNoncurrentAssets (evaluation 2)	satisfied	\$Assets=10000000 = \$AssetsCurrent=5000000 + \$AssetsNoncurrent=5000000
FAC_BS3_LiabilitiesEqualsCurrentPlusNoncurrentLiabilities (evaluation 1)	satisfied	\$Liabilities=6000000 = \$LiabilitiesCurrent=5000000 + \$LiabilitiesNoncurrent=1000000
FAC_BS3_LiabilitiesEqualsCurrentPlusNoncurrentLiabilities (evaluation 2)	satisfied	\$Liabilities=6000000 = \$LiabilitiesCurrent=5000000 + \$LiabilitiesNoncurrent=1000000
FAC_BS4_LiabilitiesAndEquityEqualsLiabilitiesPlusEquity (evaluation 1)	satisfied	\$LiabilitiesAndEquity=12000000 = \$Liabilities=6000000 + \$Equity=6000000
FAC_BS4_LiabilitiesAndEquityEqualsLiabilitiesPlusEquity (evaluation 2)	satisfied	\$LiabilitiesAndEquity=10000000 = \$Liabilities=6000000 + \$Equity=4000000
FAC_IS1_GrossProfitFoots (evaluation 1)	satisfied	\$GrossProfitLoss=3000000 = (\$RevenuesNet=4000000 - \$CostOfSales=1000000)
FAC_IS1_GrossProfitFoots (evaluation 2)	satisfied	\$GrossProfitLoss=-1000000 = (\$RevenuesNet=5000000 - \$CostOfSales=6000000)
FAC_IS1_GrossProfitFoots (evaluation 3)	satisfied	\$GrossProfitLoss=3006000 = (\$RevenuesNet=4005000 - \$CostOfSales=999000)
FAC_IS1_GrossProfitFoots (evaluation 4)	satisfied	\$GrossProfitLoss=6000 = (\$RevenuesNet=5000 - \$CostOfSales=-1000)
FAC_IS2_OperatingIncomeLossFoots (evaluation 1)	satisfied	\$OperatingIncomeLoss=3000000 = (\$GrossProfitLoss=3000000 - \$OperatingExpenses=1000000 + \$OtherOperatingIncome=1000000)
FAC_IS2_OperatingIncomeLossFoots (evaluation 2)	satisfied	\$OperatingIncomeLoss=-1000000 = (\$GrossProfitLoss=-1000000 - \$OperatingExpenses=1000000 + \$OtherOperatingIncome=1000000)
FAC_IS3_IncomeLossFromContinuingOperationsBeforeTaxFoots (evaluation 1)	satisfied	\$IncomeLossFromContinuingOperationsBeforeIncomeTaxes=1000000 = (\$OperatingIncomeLoss=3000000 + \$NonoperatingIncomeLoss=-2000000)
FAC_IS3_IncomeLossFromContinuingOperationsBeforeTaxFoots (evaluation 2)	satisfied	\$IncomeLossFromContinuingOperationsBeforeIncomeTaxes=-3000000 = (\$OperatingIncomeLoss=-1000000 + \$NonoperatingIncomeLoss=-2000000)
FAC_IS4_IncomeLossFromContinuingOperationsAfterTaxFoots (evaluation 1)	satisfied	\$IncomeLossFromContinuingOperations=500000 = (\$IncomeLossFromContinuingOperationsBeforeIncomeTaxes=1000000 - \$IncomeTaxExpenseBenefit=500000)
FAC_IS4_IncomeLossFromContinuingOperationsAfterTaxFoots (evaluation 2)	satisfied	\$IncomeLossFromContinuingOperations=-4000000 = (\$IncomeLossFromContinuingOperationsBeforeIncomeTaxes=-3000000 - \$IncomeTaxExpenseBenefit=1000000)
FAC_IS5_NetIncomeLossFootsFoots (evaluation 1)	satisfied	\$NetIncomeLoss=500000 = (\$IncomeLossFromContinuingOperations=500000 + \$IncomeLossFromDiscontinuedOperationsNet=0)
FAC_IS5_NetIncomeLossFootsFoots (evaluation 2)	satisfied	\$NetIncomeLoss=-4000000 = (\$IncomeLossFromContinuingOperations=-4000000 + \$IncomeLossFromDiscontinuedOperationsNet=0)
FAC_CF1_NetCashFlowEqualsOperatingInvestingAndFinancing (evaluation 1)	satisfied	\$CashFlowNet=-1000000 = \$CashFlowProvidedByUsedInOperatingActivitiesNet=-1000000 + \$CashFlowsProvidedByUsedInInvestingActivitiesNet=2000000 + \$CashFlowsProvidedByUsedInFinancingActivitiesNet=2000000

Microsoft 10-K Representation¹⁴

Finally, we tie all of this to a real XBRL-based financial report provided by a public company to the Securities and Exchange Commission. There are pros and cons related to using actual XBRL-based reports. First, they have lots of errors generally. Those errors can mislead your understanding. All things considered; the Microsoft reports are very good. Another downside is that you see the same things over, and over, and over. Finally, not all information model patterns are provided in all reports so it is hard to judge whether things are right or wrong relative to other information patterns that do not exist in a report.

On the pro side, they are real. The Microsoft 10-K has 194 individual structures that follow the 9 fundamental information models discussed in this document. But, Microsoft does not provide rules for most of the mathematical relations so (a) it is hard for them to tell if they got the relations right when they created the report and (b) it is hard to know if the numbers are right when you use information from the report.

¹⁴ Summary of Human Readable Reports, <http://xbrl.squarespace.com/journal/2019/3/23/summary-of-human-readable-renderings.html>

To use the Microsoft report, see the following:

SEC Filing page:

<https://www.sec.gov/Archives/edgar/data/789019/000156459017014900/0001564590-17-014900-index.htm>

XBRL instance:

<https://www.sec.gov/Archives/edgar/data/789019/000156459017014900/msft-20170630.xml>

XBRL Cloud Evidence Package (Human readable review tool)

<http://xbrl.azurewebsites.net/2017/Prototypes/Microsoft2017/evidence-package/>

XBRL Cloud Reporting Checklist and Disclosure Mechanics Rules Validation:

<http://xbrl.azurewebsites.net/2017/Prototypes/Microsoft2017/Disclosure%20Mechanics%20and%20Reporting%20Checklist.html>

<http://xbrl.squarespace.com/journal/2019/3/29/quarterly-xbrl-based-public-company-financial-report-quality.html>

Microsoft 10-K Representation – Filling in the Missing Pieces Following SBRM¹⁵

BONUS POINTS. Complete the missing pieces of the Microsoft 10-K. But, check all the things that Microsoft did not check using automated processes:

Disclosure mechanics validation:

http://xbrl.azurewebsites.net/2020/Prototype/Microsoft/Microsoft2017_Discovery.jpg

Disclosure mechanics rules:

<http://xbrl.azurewebsites.net/2020/reporting-scheme/us-gaap/disclosure-mechanics/DisclosureMechanicsRulesInNaturalLanguage.html>

¹⁵ Microsoft following the SBRM Model, <http://xbrl.azurewebsites.net/2020/master/msft/>

Other Resources for Mastering XBRL-based Financial Reporting

The many documents referenced by this resource contain many, many links to other important resources that are available to help you understand this information. I would invite you to explore those additional resources. They are helpful.

There are two additional helpful resources. The first is the collection of information that I call *Intelligent XBRL-based Digital Financial Reporting*¹⁶. All the useful information that I collect ends up in that document ultimately.

The second is a financial report taxonomies and other metadata for US GAAP, IFRS, and other financial reporting schemes¹⁷. Those are all instantiations of these ideas.

¹⁶ Charles Hoffman, CPA and Rene van Egmond, *Intelligent XBRL-based Digital Financial Reporting*, <http://xbrl.squarespace.com/intelligent-xbrl/>

¹⁷ *Modern Approach to Creating a Financial Reporting Scheme*, <http://xbrl.squarespace.com/journal/2019/12/19/modern-approach-to-creating-a-financial-reporting-scheme.html>