

Arriving at 2014 Digital Financial Reporting All Stars: Summary

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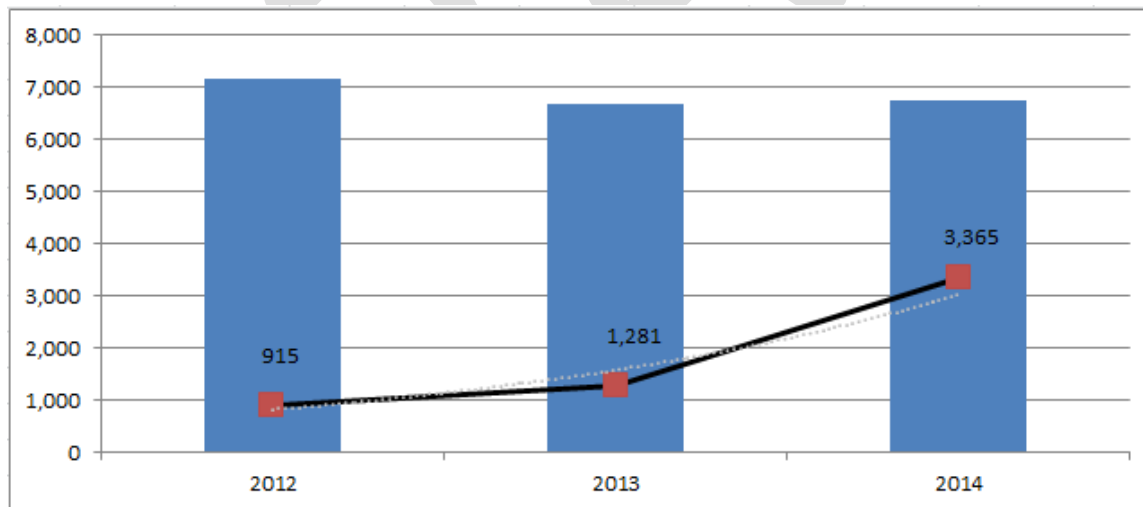
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This document walks through the results of measuring XBRL-based public company financial reports submitted to the SEC through a process outlined in the document *Understanding Minimum Processing Steps for Effective Use of SEC XBRL Financial Filing Information*¹. The process measures the basic usability by machine-based processes of information within XBRL-based financial reports submitted to the SEC by public companies.

The following table is a summary of the results of this testing for the current year of 2014 with comparison information provided for 2013 and 2012.

Minimum Processing Steps Measure	2014 ²	2013 ³	2012 ⁴
Financial reports analyzed (10-Ks for the fiscal year)	6,751	6,674	7,160
Number of "All Stars" (reports consistent with rules)	3,365	1,281	915
Percent of "All Stars" (percent of total which are consistent)	50%	19%	13%

The following chart shows the change in the number of "All Stars" (XBRL-based public company financial reports consistent with all of the minimum criteria consistency tests):



¹ Minimum processing steps, <http://www.xbrl.com/2014/Library/UnderstandingMinimumProcessSteps-2014-02-14.pdf>

² Set is made up of 10-K submissions to the SEC between April 1, 2014 and March 31, 2015.

³ See results of 2013 testing, http://www.xbrl.com/2014/Library/AnalysisSummary_ArrivingAtDigitalFinancialReportingAllStars.pdf

⁴ See results of 2012 testing, <http://xbrl.squarespace.com/journal/2014/3/13/set-of-915-digital-financial-reporting-all-stars.html>



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There were two significant differences between testing of 2014 10-K submissions and testing of the prior year 2013 10-K submissions which are worth noting. The first difference is that commercially available software was used for testing of the current 2014 10-K submissions. In the prior year, what can best be described as a mixture of commercial software and working prototype software was used for testing. The second difference was the introduction of report frames for evaluating fundamental accounting concept relations consistency. Report frames or reporting pallets are explained in the document, *Summary Information about Conformance with Fundamental Accounting Concept Relations*⁵.

The following is a summary of the 2014 results for each category of the minimum criteria with comparable information for 2013 and 2012:

#	Goal or Desired State	Process tests	FY 2014	FY 2013	FY 2012
1	XBRL: Consistent XBRL technical syntax	Automated XBRL technical syntax consistency checks	99.9%	99.9%	99.9%
2	EFM: Consistent with EDGAR Filer Manual (EFM) syntax/semantics	Automated EFM syntax and semantics consistency checks	81.9%	97.9%	80.5%
3	Report Level Model Structure: Consistent report level structure	Automated report model structure consistency checks	98.2%	95.8%	97.9%
4	Root Entity: Detectable economic entity or accounting entity or “entity of focus”	Successful and unambiguous identification of the “entity of focus”	99.5%	99.2%	98.8%
5	Key Periods: Detectable and unambiguous current period balance sheet and income statement period dates	Successful and unambiguous identification of the current balance sheet date and income statement period	99.3%	98.6%	99.8%
6	FAC: Detectable and unambiguous set of fundamental reported facts and intact relations between those fundamental facts which is consistent with expectation	Automated consistency checks to be sure fundamental accounting concepts are distinguishable and the relations between those fundamental concepts are intact/sound	98.7%	97.8%	97.9%
7	PFS: Detectable basic primary financial statements	Automated detection of balance sheet, income statement, and cash flow statement	88.7%	87.8%	NOT TESTED
8	PFS Roll Ups: Detectable basic primary financial statement roll up computations are intact which prove trustworthy nature of information (actual computation not tested, only existence of business rules)	Automated verification checks for existence of business rules which articulate these basic primary financial statement relations	92.0%	90.5%	84.9%
9	Reporting Units: Detectable reporting units of reporting entity.	Automated detection of proper reporting units of reporting entity.	NOT TESTED	NOT TESTED	NOT TESTED

Each category of the minimum criteria shows improvement except for consistency with EFM rules.

⁵ *Summary Information about Conformance with Fundamental Accounting Concept Relations*, <http://www.xbrlsite.com/2014/Library/SummaryInformationAboutConformanceWithFundamentalAccountingConceptRelations.pdf>



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Others are encouraged to repeat this analysis of XBRL-based public company financial reports to the SEC in order to measure the progress toward quality of such reports. The software algorithm used to retrieve information for this minimal set of reported facts clearly demonstrates the process of retrieving information from such digital financial reports. While more sophisticated algorithms could have perhaps been created, the point of the exercise is not software sophistication or creative programming; rather the goal is determining what is necessary to have safe, reliable, predictable, automated reuse of reported financial information by machine-based processes.

Walk Through of Process

This section provides a high-level overview of the process for reading information from an XBRL-based digital financial report. This process helps understand why the minimum criteria are exactly that, the minimum that is necessary to use any information from a digital financial report.

An application was created in Excel which performs all of the steps necessary to read two concepts from each XBRL-based financial report in the set of 6,751 public company 10-K filings. You can download that Excel application here: <http://www.xbrlsite.com/2015/Library/MinimumCriteriaDemo2.zip>. That Excel application will allow anyone to understand what is necessary to extract information from XBRL-based public company digital financial reports. The remainder of this section describes this process.

Consider a simple query of two concepts: *Assets* and *Liabilities and Equity*. In order to extract that information from any XBRL-based financial filing using a machine-based process the following process needs to be followed:

1. Software MUST locate each report you want to query information from.
2. The report MUST be valid XBRL technical syntax. If the technical syntax is invalid, you may or may not get the correct results.
3. Software MUST appropriately identify the economic entity or root reporting entity in the report. You don't want information for one business segment, one geographic area.
4. Software MUST appropriately locate the current balance sheet date. Generally you want information about the current balance sheet data and not the prior balance sheet.
5. Software MUST find the appropriate US GAAP concept used to express Assets which is us-gaap:Assets.
6. Software MUST find appropriate US GAAP concept for Liabilities and Equity. This is a little harder because there are multiple possible concepts: us-gaap:LiabilitiesAndStockholdersEquity or us-gaap:LiabilitiesAndPartnersCapital.
7. Software MUST check the returned information to assure that it is consistent with what is expected, the business domain rule that "Assets = Liabilities and Equity". If the data returned is not consistent with expectations, then the quality of the information can be questioned.



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8. Software MUST locate the appropriate reporting units (currency). In the case of public company financial reports submitted to the SEC, 99% of entities report using US Dollars. However, 1% use other currencies as the reporting units.

The process described above is the same for any concept which someone might want to extract and use from an XBRL-based digital financial report. While the process above uses only two concepts, *Assets and Liabilities and Equity*, the minimum criteria uses 51 concepts and approximately 22 different relations. The exact concepts and relations are determined by which report frame⁶, or style of reporting, an entity uses. Because public companies might use different concepts to report the same information, mappings exist between the fundamental accounting concept one might wish to extract and the US GAAP XBRL Taxonomy concept which might have been used to report that information. For example, consider *Liabilities and Equity* which could use two concepts: `us-gAAP:LiabilitiesAndStockholdersEquity` or `us-gAAP:LiabilitiesAndPartnersCapital`. Mapping information⁷ is provided for each concept within each report frame.

Different public companies report different information, but information that is not explicitly reported can be imputed. For example, many companies do not explicitly report Noncurrent assets; however they do explicitly report Assets and Current assets. As such, the value of Noncurrent assets can be imputed using the fact that $\text{Assets} = \text{Current assets} + \text{Noncurrent assets}$. Basically, if you have two of the values, you can safely impute the third value.

That is an overview of the workflow/process to obtain a basic set of information from the set of XBRL-based public company financial filings. And here are the results of that query for every financial report in the EDGAR database for every entity:

⁶ This is a summary of the report frames used by each of the 6,751 reporting entities in the test set, <http://www.xbrlsite.com/2015/fro/us-gAAP/html/ReportFrames/ReportFrames.html>

⁷ For mapping information used for each report frame, see <http://www.xbrlsite.com/2015/fro/us-gAAP/html/ReportFrames/> which provides both machine-readable and human readable versions of mapping information.



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xbrl:Entity	Legal Entity	Fiscal Period	Fiscal Year	Assets	Liabilities and Equity	Units	Difference in Value
All CIK numbers	Root economic entity	FY	2001	280	280	iso4217:USD	0
All CIK numbers	Root economic entity	FY	2009	31,586,555,000	31,586,555,000	iso4217:USD	0
All CIK numbers	Root economic entity	FY	2010	23,061,516,000	23,061,516,000	iso4217:CAD	0
All CIK numbers	Root economic entity	FY	2010	8,833,200,000	8,833,200,000	iso4217:GBP	0
All CIK numbers	Root economic entity	FY	2010	33,205,444,569,755	33,235,543,477,631	iso4217:USD	30,098,907,876
All CIK numbers	Root economic entity	FY	2011	45,216,467	45,216,467	iso4217:AUD	0
All CIK numbers	Root economic entity	FY	2011	110,885,000	110,885,000	iso4217:BRL	0
All CIK numbers	Root economic entity	FY	2011	28,708,716,218	28,708,716,218	iso4217:CAD	0
All CIK numbers	Root economic entity	FY	2011	1,226,733,000	1,226,733,000	iso4217:EUR	0
All CIK numbers	Root economic entity	FY	2011	7,938,800,000	7,938,800,000	iso4217:GBP	0
All CIK numbers	Root economic entity	FY	2011	1,565,000	1,565,000	iso4217:ILS	0
All CIK numbers	Root economic entity	FY	2011	46,395,324,314,234	46,165,763,878,111	iso4217:USD	(229,560,436,123)
All CIK numbers	Root economic entity	FY	2012	49,066,850	49,066,850	iso4217:AUD	0
All CIK numbers	Root economic entity	FY	2012	32,470,161,238	32,470,161,238	iso4217:CAD	0
All CIK numbers	Root economic entity	FY	2012	1,303,349,000	1,303,349,000	iso4217:EUR	0
All CIK numbers	Root economic entity	FY	2012	10,504,300,000	10,504,300,000	iso4217:GBP	0
All CIK numbers	Root economic entity	FY	2012	47,493,211,088,244	47,307,285,874,940	iso4217:USD	(185,925,213,304)
All CIK numbers	Root economic entity	FY	2013	54,642,443	54,642,443	iso4217:AUD	0
All CIK numbers	Root economic entity	FY	2013	39,919,462,935	39,919,385,738	iso4217:CAD	(77,197)
All CIK numbers	Root economic entity	FY	2013	13,120,000	13,120,000	iso4217:EUR	0
All CIK numbers	Root economic entity	FY	2013	48,909,115,040,682	48,735,740,980,605	iso4217:USD	(173,374,060,077)
All CIK numbers	Root economic entity	FY	2014	342,493,649,881	342,493,649,881	iso4217:USD	0
				176,531,415,952,227	175,972,655,073,402		(558,760,878,825)
							-0.3%

The results above show that most of the balance sheets balance, $Assets = Liabilities and Equity$. Some are inconsistent with what you would expect given the accounting equation⁸, $Assets = Liabilities and equity$. The total inconsistency is .3% which is not too bad. However, the information needs to be 100% consistent in order to not get humans involved to figure out exactly what is causing the inconsistencies.

And so, if an automated machine-based process cannot make its way through obtaining a set of basic financial reporting concepts that every reporting entity must report; then the information the automated machine-based process is using cannot be considered trustworthy. On the other hand, if all this information can be retrieved, sorted out correctly, and expected computations are consistent with expectation then that information can be deemed reliable.

Meaning can only be exchange between business systems to the extent that agreed upon rules exist prior to that information exchange to be sure the technical syntax, business domain semantics, and workflow/process rules are consistent with what is expected.

Prudence dictates that using financial information from a digital financial report not be a guessing game. It is only through conscious effort that the specific control mechanisms can be put in place to realize this intent.

These minimum criteria are simply the minimum hurdle that digital financial reports must satisfy for any additional information to be usable and considered trustworthy.

⁸ Accounting equation, http://en.wikipedia.org/wiki/Accounting_equation



Details of results from testing against minimum criteria consistency constraints

This section provides a brief summary of the details of the results for each criteria in the set of minimum criteria and a narrative which briefly summarizes the importance of the criteria as it relates to the fundamental use of the reported information and any other helpful information that would help the reader understand the need for the criteria. To better understand these criteria, please refer to the document *Understanding Minimum Processing Steps for Effective Use of SEC XBRL Financial Filing Information*⁹.

*Consistent XBRL technical syntax*¹⁰:

Report perspective: (2014)		
Test	Total filings	% Total Filings
XBRL technical syntax unambiguous	6,750	99.99%
XBRL technical syntax errors	1	0.01%
Total	6,751	100.00%

The first aspect of making use of an XBRL-based public company financial report submitted to the SEC is that the technical syntax format of the information must be fundamentally and reliably readable by a machine such as a computer. This test shows that 99.99% of all XBRL-based public company financial reports submitted to the SEC during the test period are consistent with the expected technical syntax. This is consistent with what is expected.

*Consistent EDGAR Filer Manual (EFM) syntax/semantics*¹¹:

Report perspective: (2014)		
Test	Total filings	% Total Filings
EFM rules complied with	5,529	81.9%
EFM Errors	1,222	18.1%
Total	6,751	100.0%

While not every SEC EFM rule is critical to the fundamental use of reported information, some EFM rules are essential. What is interesting is that compliance with EFM rules is the lowest of all categories of

⁹ Understanding the Minimum Processing Steps,

<http://www.xbrl.org/2014/Library/UnderstandingMinimumProcessSteps-2014-02-14.pdf>

¹⁰ See <http://xbrl.squarespace.com/journal/2014/3/17/xbrl-technical-syntax-update-insights-obtained.html>

¹¹ See <http://xbrl.squarespace.com/journal/2014/3/18/automated-sec-edgar-filer-manual-efm-update-insights-obtained.html>



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rules. Why would EFM rules be the lowest of all criteria? Public companies submitting their XBRL-based financial reports to the SEC have those reports pass through SEC verification of these rules. Why would this not be 100% for all accepted XBRL-based financial report submissions?

The reason for this is twofold. First, the SEC has not completely implemented all of the automatable tests that exist in the EFM. The information provided to evaluate consistency with EFM rules is provided by XBRL Cloud. XBRL Cloud and the SEC differ in what they have implemented. This is not to say that the SEC or XBRL Cloud is correct or incorrect. They differ.

The truth is that not all EFM rules are necessary to be able to make use of reported information. Many EFM rules relate to the formatting of HTML. As such, consistency of XBRL-based financial filings with EFM rules is deemphasized; rather I will focus on the specific EFM rules which are essential to using any information.

Consistent report level model structure¹²:

Report perspective: (2014)		
Reports	Total filings	% Total Filings
Report level model structure unambiguous	6,628	98.2%
Report level model structure ambiguous	123	1.8%
Total	6,751	100.0%

Report level model structure is the relations between the categories of structural pieces which make up a digital financial report: Network, Table, Axis, Member, Line Items, Concept, Abstract. Each category of report element has relations to other report elements. The table of information above looks at issues with these relations from the perspective of the filing having one or more of these report level model structure inconsistencies.

The table of information below looks at these issues from the perspective of all the relations which exist.

¹² See <http://xbrl.squarespace.com/journal/2014/3/16/report-level-model-structure-update-insights-obtained.html>



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Relationship perspective: (2014)			
Class	Total relations	Unambiguous relations	Undefined or ambiguous relations
Networks	494,219	494,174	45
Tables	617,897	617,710	187
Axis	475,281	475,280	1
Member	849,704	849,583	121
LinItems	1,306,473	1,306,376	97
Abstracts	2,387,613	2,387,425	188
Concepts	11,391	11,380	11
Total	6,142,578	6,141,928	650
Percent	100.00%	99.99%	0.01%

There are two key points which this information makes. The first point is that there are two perspectives which one can look at issues. One is from the perspective of a filing, *how many inconsistencies does a filing contain*. Another is from the perspective of *all possible inconsistencies which could occur*. So looking at the information above from the perspective of filings, a total of 123 filings had inconsistencies, which represented 4.2% of all XBRL-based financial filings. Looking at this from the perspective of total possible inconsistencies, there were a total of 650 inconsistencies in all filings, which represented a total of .01% of total possible inconsistencies. The graphic below shows all relations within the set of 6,751 XBRL-based digital financial reports submitted to the SEC in the set tested:

		2014 10-Ks LAX Model, SEC filers supported						
		Parent						
		Network	Table	Axis	Member	LinItems	Abstract	Concept
		495,825	211,910	406,005	1,324,898	211,995	742,468	3,245,302
Child	Network	0	0	0	0	0	0	0
	Table	682	0	0	0	5	211,212	11
	Axis	0	405,998	0	0	0	7	0
	Member	4	0	475,280	849,583	2	29	0
	LinItems	41	211,712	0	0	90	152	0
	Abstract	493,480	168	0	3	100,789	147,603	425
	Concept	12	19	1	118	1,205,587	2,028,610	10,955

The second point is that there needs to be a fundamental agreement as to the report level relations between the categories of report elements which make up an XBRL-based digital financial report.

This is not a significant issue because 99.99% of the relations between Tables, Axes, Members, Line Items, Concepts, and Abstracts are consistent with expectation and therefore are not ambiguous. However, a very small majority of relations are potentially ambiguous. None of these are really issues



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with the information we are reading from XBRL-based digital financial reports with the minimum criteria because we are not using information that would be differentiated from other information using these sorts of report structures. All the information the minimum criteria uses is fairly easy to read from a digital financial report. However, then more detailed information is extracted, these sorts of report level model structure inconsistencies can cause problems.

Detectable economic entity or accounting entity or “root reporting entity” or “entity of focus”¹³:

Report perspective: (2014)		
Test	Total filings	% Total Filings
Root or “entity of focus” successfully discovered	6,720	99.5%
Root entity not found	31	0.5%
Total	6,751	100.0%

A machine-based process needs to be able to identify and distinguish the root economic entity which a financial report is about from breakdowns of that information by business segment, geographic area, subclass of a report line item, or other such breakdown. The minimum criteria only attempt to read the root economy entity, not any disaggregated information which may be reported. The EFM has a mechanism for identifying the root economic entity and 99.5% of reporting entities follow that criteria and the root economic entity is distinguishable.

Detectable and unambiguous current period balance sheet and income statement period dates¹⁴:

Report perspective: (2014)		
Test	Total filings	% Total Filings
Balance sheet date unambiguous	6,704	99.3%
Balance sheet date ambiguous/inconsistent	47	0.7%
Total	6,751	100.0%

¹³ See <http://xbrl.squarespace.com/journal/2014/3/18/detecting-economic-entity-or-entity-of-focus-update-insights.html>

¹⁴ See <http://xbrl.squarespace.com/journal/2014/3/18/detection-of-current-balance-sheet-date-update-insights-obta.html>



Once you know that you have the appropriate root economic entity you also need to discern which period is the correct period for the information you desire to work with. The minimum criteria only make use of the current balance sheet information, year-to-date income statement, and year-to-date cash flow statement information. The cash flow statement period is the same as the income statement period. The EFM rules provide for a method to detect the current balance sheet and the year-to-date income/cash flow statement periods. And, 99.3% of all SEC XBRL financial filings follow those rules and information is therefore discernable.

Detectable and unambiguous primary financial statements:

Report perspective: (2014)		
Test	Total filings	% Total Filings
Each primary financial statement was detected	5,990	88.7%
One or more primary financial statements not detected	761	11.3%
Total	6,751	100.0%

While not essential for identifying and obtaining basic reported facts we seek using the minimum criteria, it does seem reasonable that a machine-based process should be able to detect each of the primary financial statements: balance sheet, income statement, and cash flow statement. And in 88.7% of all reporting entities, this expectation is met. This test considers the fact that some entities also report a statement of comprehensive income.

Detectable and unambiguous set of fundamental reported facts and intact relations between those fundamental facts which prove trustworthy nature of information¹⁵:

Report perspective: (2014)					
Test	Total filings	% Total Filings		Total tests	% Total Tests
All fundamental accounting concepts correct	3,934	58%		339,838	98.7%
Has fundamental accounting concept errors	2,817	42%		4,463	1.3%
Total	6,751	100%		344,301	100.0%

¹⁵ See <http://xbrl.squarespace.com/journal/2014/3/16/fundamental-accounting-concepts-update-insights-obtained.html>



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Again, recognizing the difference between the *filing perspective* and the *test perspective*; 58% of all filings were consistent with expected relationships between 51 fundamental accounting concepts and 22 relations between those concepts. All 51 facts were either explicitly reported or found or the facts were easily imputed using known relations between concepts.

From the perspective of *each test* that checked the consistency with what would be expected, 98.7% of all tests for these fundamental accounting concepts were consistent with what was expected.

While the aggregate information for these fundamental accounting concept relations is interesting, the detailed information for each test is even more telling. The table below shows each of the 21 tests of what can be considered relationships which always exist between specific fundamental accounting concepts¹⁶. Of these relations, 14 of 21 were satisfied by over 95% of all XBRL-based public company digital financial reports submitted to the SEC.

Every fundamental accounting concept relation tested is consistent with 90% or more of all XBRL-based public company financial reports which have been submitted to the SEC. At a minimum, the relations are certainly not wrong since so many public companies follow those relations. However, it is possible that some of the relations could be valid although they are obscure. These edge cases will become increasingly evident as the number of inconsistencies one must look through goes down.

¹⁶ For more information on the fundamental accounting concepts and relations between these concepts see <http://fundamentalaccountingconcepts.wikispaces.com/>



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#	Category	Test Code	Fundamental accounting concept relation	Total filings	Consistent with rule	Consistent %	Inconsistent with rule	Inconsistent %
1	BS	BS1	Equity = Equity Attributable to Parent + Equity Attributable to Noncontrolling Interest	6,751	6,655	98.58%	96	1.42%
2	BS	BS2	Assets = Liabilities and Equity	6,751	6,734	99.75%	17	0.25%
3	BS	BS3	Assets = Current Assets + Noncurrent Assets (classified balance sheet)	6,751	6,393	94.70%	358	5.30%
4	BS	BS4	Liabilities = Current Liabilities + Noncurrent Liabilities (classified balance sheet)	6,751	6,672	98.83%	79	1.17%
5	BS	BS5	Liabilities and Equity = Liabilities + Commitments and Contingencies + Temporary Equity + Redeemable Noncontrolling Interest + Equity	6,751	6,472	95.87%	279	4.13%
6	CF	CF1	Net Cash Flow = Net Cash Flows, Operating + Net Cash Flows, Investing + Net Cash Flows, Financing + Exchange Gains (Losses)	6,751	6,435	95.32%	316	4.68%
7	CF	CF2	Net Cash Flows, Continuing = Net Cash Flows, Operating, Continuing + Net Cash Flows, Investing, Continuing + Net Cash Flows, Financing, Continuing	6,751	6,542	96.90%	209	3.10%
8	CF	CF3	Net Cash Flows, Discontinued = Net Cash Flows, Operating, Discontinued + Net Cash Flows, Investing, Discontinued + Net Cash Flows, Financing, Discontinued	6,751	6,711	99.41%	40	0.59%
9	CF	CF4	Net Cash Flows, Operating = Net Cash Flows, Operating, Continuing + Net Cash Flows, Operating, Discontinued	6,751	6,719	99.53%	32	0.47%
10	CF	CF5	Net Cash Flows, Investing = Net Cash Flows, Investing, Continuing + Net Cash Flows, Investing, Discontinued	6,751	6,738	99.81%	13	0.19%
11	CF	CF6	Net Cash Flows, Financing = Net Cash Flows, Financing, Continuing + Net Cash Flows, Financing, Discontinued	6,751	6,747	99.94%	4	0.06%
12	IS	IS1	Gross Profit = Revenues - Cost Of Revenue (Multi-step approach)	6,751	6,354	94.12%	397	5.88%
13	IS	IS2	Operating Income (Loss) = Gross Profit - Operating Expenses + Other Operating Income (Expenses) (Multi-step approach)	6,751	6,439	95.38%	312	4.62%
14	IS	IS3	Income (Loss) from Continuing Operations Before Equity Method Investments = Operating Income (Loss) + Nonoperating Income (Loss) - Interest And Debt Expense	6,751	6,179	91.53%	572	8.47%
15	IS	IS4	Income (Loss) from Continuing Operations Before Tax = Income (Loss) from Continuing Operations Before Equity Method Investments + Income (Loss) from Equity Method Investments	6,751	6,691	99.11%	60	0.89%
16	IS	IS5	Income (Loss) from Continuing Operations after Tax = Income (Loss) from Continuing Operations Before Tax - Income Tax Expense (Benefit)	6,751	6,334	93.82%	417	6.18%
17	IS	IS6	Net Income (Loss) = Income (Loss) from Continuing Operations After Tax + Income (Loss) from Discontinued Operations, Net of Tax + Extraordinary Items, Gain (Loss)	6,751	6,360	94.21%	391	5.79%
18	IS	IS7	Net Income (Loss) = Net Income (Loss) Attributable to Parent + Net Income (Loss) Attributable to Noncontrolling Interest	6,751	6,351	94.07%	400	5.93%
19	IS	IS8	Net Income (Loss) Available to Common Stockholders, Basic = Net Income (Loss) Attributable to Parent - Preferred Stock Dividends and Other Adjustments	6,751	6,713	99.44%	38	0.56%
20	SCI	IS9	Comprehensive Income (Loss) = Comprehensive Income (Loss) Attributable to Parent + Comprehensive Income (Loss) Attributable to Noncontrolling Interest	6,751	6,605	97.84%	146	2.16%
21	SCI	IS10	Comprehensive Income (Loss) = Net Income (Loss) + Other Comprehensive Income (Loss)	6,751	6,464	95.75%	287	4.25%

While it could be expedient to increase the results of the fundamental accounting concept consistency checks by dropping the tests with passing rates below 95%, the problem with that is that if the tests were dropped then the goal of being able to make use of the reported information would not be achievable. This is because all of these fundamental accounting concept relations must be in tact to assure that the information reported is trustworthy. Even one inconsistency in one relation means that a human needs to get involved to sort out what is going on.

Also, while it is perhaps possible to create more sophisticated software algorithms for reading the reported financial information and sorting that information out correctly so that information can be



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safely, reliably, and predictably; I would argue that it is counterproductive to do so. First, as 88.7% of all XBRL-based public company financial reports to the SEC are consistent with expected results, arguably getting to the bottom of the specific reasons why a minority of reports is not consistent with these expectations would seem prudent. Further, the fewer guessing games involved with reading this fundamental and foundational information, the safer, more reliable, and more predictable using all the information within an XBRL-based digital financial report would be.

As such, it is inappropriate to drop any portion of this framework for making use of reported digital financial information.

Detectable basic primary financial statement roll up computations are intact which prove trustworthy nature of information¹⁷:

Report perspective: (2014)						
Breakdown by filing	Assets	Liabilities and Equity	Net Cash Flow	Net Income	All Four Roll Ups	% Total Filings
Expected roll up WAS discovered	6,272	6,245	5,521	6,003	6,213	92.0%
Expected roll up missing	123	123	326	387	538	8.0%
Total	6,751	6,751	6,751	6,751	6,751	100.0%

Rule perspective: (2014)		
Breakdown by test	Total Tests	% Total Tests
Roll up present	24,041	89.0%
Roll up not present	959	3.6%
Total	27,004	100.0%

From the *perspective of the filings*, 92.0% of all XBRL-based public company financial reports submitted to the SEC in this set provide business rules which document the roll ups of information on the primary financial statements. A filer must provide all four of these roll ups to satisfy this result. So, for example, if a filer provides three of the four, they fail to be consistent with this criteria. And most filers do satisfy this minimum criteria which is part of EFM rules.

If one were to look at this on a per roll up basis, then 89.0% of all filers provide the required roll up rules which specify how their balance sheet, income statement, and cash flow statement foots. While this criteria is not technically necessary to make use of the basic information; to make use of the primary

¹⁷ See <http://xbrl.squarespace.com/journal/2014/3/18/primary-financial-statement-roll-up-computation-update-insig.html>



financial statement information having the comfort of knowing that these basic roll ups do in fact roll up correctly is certainly very good information.

Summary Minimum Criteria Results by Generator: (software vendor or filing agent)

The following table shows the filing count of the set of 6,751 XBRL-based financial filings broken out by generator of the report (software or filing agent), the filings with no inconsistencies (i.e. the number of all stars), the sum of inconsistencies, average inconsistency per filing and percent of filings without inconsistency (number of All-Stars divided by total filings):

Consistent with all Minimum Criteria, ignore nonrelevant EFM rules					
Generator	Filings Count	Filings With No Issues	Sum Issues (all filings)	Average Issues per Filing	Percent Without Issues
Trintech	1	1	0	.0	100%
RR Donnelley	947	657	465	.5	69%
DataTracks	400	232	286	.7	58%
Ez-XBRL	331	191	230	.7	58%
CompSci	413	236	287	.7	57%
P3 Data Systems	199	112	171	.9	56%
Compliance Xpressware	83	46	67	.8	55%
Rivet	230	122	210	.9	53%
WebFilings	1,925	991	1,624	.8	51%
Accelus	196	95	168	.9	48%
Merrill	476	218	412	.9	46%
Unknown	34	15	41	1.2	44%
Novaworks Software	551	218	751	1.4	40%
GoXBRL	269	106	334	1.2	39%
QXi	156	54	200	1.3	35%
IBM Cognos	100	34	178	1.8	34%
Fujitsu	13	4	31	2.4	31%
SAP Disclosure Management	4	1	76	19.0	25%
NeoClarus	93	14	249	2.7	15%
Advanced Computer Innovations	323	18	979	3.0	6%
Oracle	2	0	6	3.0	0%
SmartXBRL	5	0	13	2.6	0%
	6,751	3,365	6,778	1.0	
		49.8%			

The primary purpose behind breaking this information out by generator is to determine if there are any software vendors or filing agents which stand out or which have systems which will always pass 100% of these automatable consistency tests.



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Any software vendor or filing agent could create a complete set of automatable tests which can be used to verify the consistency of an XBRL-based public company financial report with these minimum criteria. This would make sure that 100% of that generators filings passed all of these consistency checks.

Don't like my criteria? Not a problem, specify some other criteria and meet 100% of those; and of course the information needs to be safely, reliably, and predictably usable.

Summary of Each Minimum Criteria Test and Results by Generator:

The following table shows a summary of total issues broken out by criteria (in the columns) and by generator (in the rows). On the right you can see the "Total Issues". The average number of issues per filing is 1.0. A number below 1.0 is better than average, a number higher than that is below average.

Generator	XBRL Technical Syntax	Report Level Model Structure	Root Reporting Entity Detection	Balance Sheet and Income Statement Date Consistency	Fundamental Accounting Concept Relations Consistency	Detect Primary Financial Statements	Detect Primary Financial Statement Roll ups	Total Issues	Total Number of Filings	Issues per Filing
Accelus	0	6	0	4	135	22	2	168	196	0.9
Advanced Computer Innovations	0	12	1	21	310	164	471	979	323	3.0
Compliance Xpressware	0	0	0	4	43	17	3	67	83	0.8
CompSci	0	2	0	6	237	42	0	287	413	0.7
DataTracks	0	0	0	5	246	33	2	286	400	0.7
Ez-XBRL	0	7	0	2	196	22	3	230	331	0.7
Fujitsu	0	19	0	0	11	1	0	31	13	2.4
GoXBRL	0	5	0	5	233	71	20	334	269	1.2
IBM Cognos	0	61	1	6	92	15	3	178	100	1.8
Merrill	0	59	2	3	297	39	12	412	476	0.9
NeoClarus	0	1	2	5	85	65	91	249	93	2.7
Novaworks Software	0	49	2	9	455	106	130	751	551	1.4
Oracle	0	3	0	0	2	1	0	6	2	3.0
P3 Data Systems	0	45	0	1	107	13	5	171	199	0.9
QXi	0	16	0	7	131	43	3	200	156	1.3
Rivet	0	0	0	3	161	16	30	210	230	0.9
RR Donnelley	0	10	3	15	376	59	2	465	947	0.5
SAP Disclosure Management	1	71	0	1	1	2	0	76	4	19.0
SmartXBRL	0	0	0	0	5	1	7	13	5	2.6
Trintech	0	0	0	0	0	0	0	0	1	0.0
Unknown	0	3	0	0	25	10	3	41	34	1.2
WebFilings	0	3	20	20	1,315	207	59	1,624	1,925	0.8
Total	1	372	31	117	4,463	949	846	6,778	6,751	1.0
Change from 2013	-8	-445	-21	67	-4,457	133	-1,809	-11,611		

The bottom of the above table shows the change between 2013 and 2014 minimum criterial testing results. Over all, the total number of issues has decreased by 11,611 issues. Every criterion has shown a



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decrease except for two. Balance sheet and income statement date consistency increased by 67 because in the prior year only the balance sheet date consistency was checked, in the current year both balance sheet and income statement date consistency was checked. The total of 117 can be broken down to 47 balance sheet date inconsistencies and 70 income statement date inconsistencies. The prior year showed 50 balance sheet date inconsistencies, so that specific inconsistency decreased by 3 filings. Detection of the primary financial statements decreased by 133 because the prior year process had a manual component to it, in 2004 the process is 100% automated.

Below is a distribution of fundamental accounting concept issues by generator in the rows, by test in the columns. Total fundamental accounting issues¹⁸, total number of filings per generator, and the average number of issues per filing are shown on the far right.

Generator	BS1	BS2	BS3	BS4	BS5	IS1	IS2	IS3	IS4	IS5	IS6	IS7	IS8	IS9	IS10	CF1	CF2	CF3	CF4	CF5	CF6	Total Issues	Total Filings	Avg Issues per Filing
Accelus	0	0	16	6	4	9	17	26	6	13	8	10	3	7	9	2	1	2	0	0	0	135	196	0.7
Advanced Computer Innovations	5	3	14	0	23	39	18	19	5	29	58	31	2	9	11	30	5	4	7	2	0	310	323	1.0
Compliance Xpressware	0	0	6	0	2	4	1	5	0	4	3	6	0	4	0	6	1	1	0	0	0	43	83	0.5
CompSci	5	2	32	4	18	26	8	38	6	23	20	15	1	6	15	18	0	1	1	1	0	237	413	0.6
DataTracks	1	0	17	3	16	29	18	37	7	26	17	15	1	8	15	19	3	3	9	1	2	246	400	0.6
Ez-XBRL	3	1	16	0	14	27	11	27	8	24	15	15	1	2	8	17	4	1	2	2	0	196	331	0.6
Fujitsu	0	0	1	0	1	2	0	1	2	0	0	1	0	1	1	2	0	0	1	0	0	11	13	0.8
GoXBRL	9	1	10	2	17	23	14	16	2	21	23	39	0	5	10	30	9	1	0	0	1	233	269	0.9
IBM Cognos	3	1	13	2	1	0	11	12	4	12	9	7	1	3	11	4	1	1	0	0	0	92	100	0.9
Merrill	5	0	20	3	17	15	13	32	8	21	21	17	2	10	14	7	93	3	1	0	0	297	476	0.6
NeoClarus	2	2	9	1	6	11	7	4	2	10	9	11	3	0	2	5	0	1	0	0	0	85	93	0.9
Novaworks Software	15	3	40	7	29	49	37	38	4	30	40	49	0	10	22	58	18	3	2	2	1	455	551	0.8
Oracle	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	2	2	1.0
P3 Data Systems	3	0	9	2	11	13	8	15	0	11	8	10	0	2	8	5	1	0	1	0	0	107	199	0.5
QXi	3	1	6	1	5	16	8	12	1	10	7	21	2	5	4	20	5	1	2	1	0	131	156	0.8
Rivet	1	0	11	3	11	13	14	31	5	13	13	12	1	10	16	5	2	2	0	1	0	161	230	0.7
RR Donnelley	10	1	35	11	32	32	28	62	18	35	22	32	8	10	23	21	4	2	1	0	0	376	947	0.4
SAP Disclosure Management	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	4	0.3
SmartXBRL	0	0	1	1	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	5	5	1.0
Trintech	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.0
Unknown	0	1	2	0	1	3	0	3	0	4	4	3	0	0	0	4	0	0	0	0	0	25	34	0.7
Workiva (WebFilings)	31	1	100	33	71	86	99	193	67	130	113	105	13	52	118	63	62	14	5	3	0	1,315	1,925	0.7
Total	96	17	358	79	279	397	312	572	145	417	391	400	38	146	287	316	209	40	32	13	4	4,463	6,751	0.7
Change	-67	-12	266	-79	-28	-15	-76	-259	-114	12	-40	-36	-328	-142	43	57	-20	-8	4	-6	-3	-936	77	-0.1

On average XBRL-based public company financial filing to the SEC contained .7 fundamental accounting concept inconsistencies in 2014, this is down from .8 in 2013. The total number of issues is 4,463 which is down from 5,399 in the prior year 10-Ks for a decrease of 936. Note that there are 77 more filings in 2014 than in 2013.

¹⁸ For a description of the relation the test is evaluating see

<http://fundamentalaccountingconcepts.wikispaces.com/>



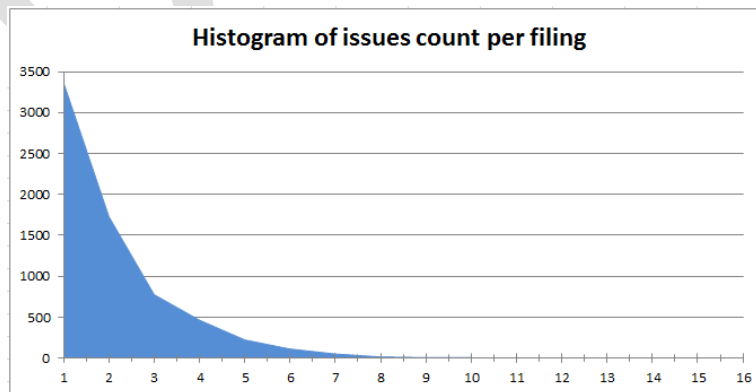
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Inconsistencies by Filing Histogram:

This graphic below shows the number of issues in a filing (column 1), the number of filings which have that issue count (column 2), the cumulative number of filings (column 3), and the percent of total filings (column 4). As shown in row 1; 3,365 filings have no issues which represents 49.84% of total filings (I rounded the percent to 50% when I used that figure before).

# of Issues per Filing	# of Filings with this Issues Count	Cumulative Number of Filings	% of Total Filings
0	3,365	3,365	49.84%
1	1,729	5,094	75.46%
2	776	5,870	86.95%
3	464	6,334	93.82%
4	223	6,557	97.13%
5	111	6,668	98.77%
6	51	6,719	99.53%
7	15	6,734	99.75%
8	6	6,740	99.84%
10	5	6,745	99.91%
45	1	6,746	99.93%
11	1	6,747	99.94%
15	1	6,748	99.96%
16	1	6,749	99.97%
30	1	6,750	99.99%
32	1	6,751	100.00%

What is interesting is row 2. There are 1,729 filings which have only 1 issue; and if those issues are corrected then 75% of filings will have no issues. 98.77% of filings have 5 or fewer issues which need to be corrected. Graphically, it looks like this:



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Conclusions reached and insights obtained

Prudence dictates that using financial information from a digital financial report not be a guessing game. It is only through conscious effort that the specific control mechanisms can be put in place to realize this intent, to eliminate the guessing game.

It is only through conscious collaboration, cooperation and coordination by the participants of the financial reporting supply chain that that XBRL-based digital financial reporting will work safely, reliably, predictably, repeatedly, effectively, and efficiently. That is the goal.

Inconsistencies with rules for creating a digital financial report exist for specific reasons and specific things need to be done to correct the inconsistencies:

- Correction of filing errors in the reports of public companies which are not consistent with the specified rules.
- Correction of rule errors in the set of tests used to verify consistency to specific rules.
- Correction of US GAAP XBRL Taxonomy errors which can make it impossible for public companies to represent their report information consistent with the rules (i.e. concepts missing from the taxonomy).

The analysis of SEC XBRL financial filings is not intended to be a perfect scientific experiment; rather it is a very good and high-quality practical exercise to both learn about what it takes to make use of information provided by XBRL-based digital financial reports and to show that specific things contribute to that successful information use.

So, while not a perfect scientific experiment or perhaps not perfect in any regard; this exercise was very useful and yielded pragmatic insight into creating and consuming digital financial reports. This information is useful to professional accountants wishing to position themselves well for the future of financial reporting. It is useful to software vendors who might choose to build software to support digital financial reporting. It is useful to regulators who might be considering implementing systems which leverage XBRL-based reporting in support of digital financial reporting.

The following is a summary of specific conclusions I have reached and other insights I have obtained which I believe might also be useful to others.

- **Inconsistencies with expected results which are indicated by the machine-readable tests are decreasing:** This is shown in the detailed results.
- **Currently 50% of all SEC XBRL financial filings analyzed satisfy minimum criteria and 98% are 5 or fewer inconsistencies from meeting all criteria:** Each of these issues is specifically identifiable and understandable. It is possible to determine if the filing is in error, the test is in error, or the taxonomy is in error.
- **Specific reasons exist for every issue pointed out:** I am not holding out my tests as being 100% correct. I do stand by the tests and the results of those tests, such as the fundamental



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accounting concept relations, until someone proves to me that some specific error which needs to be corrected exists in my tests. With so many SEC XBRL financial filings satisfying these seven minimum criteria it is perhaps hard to justify those that do not. Each issue discovered within an XBRL-based public company financial filing to the SEC can be physically observed. Observing each of these issues relative to other digital financial reports which do satisfy and which do not satisfy these criteria is the way to judge the cause of any inconsistency. For each issue, evidence observed can determine if: (a) a rule is inappropriate and should be changed; (b) a change is needed in the US GAAP XBRL taxonomy; (c) an public company needs to fix their digital financial report.

- **Using XBRL-based public company financial information need not and should not be a guessing game:** The goal is safe, reliable, predictable, automated reuse of reported financial information. Prudence dictates that using financial information from an XBRL-based public company financial filing to the SEC should not be a guessing game.
- **Minimum criteria test mechanical aspects of a digital financial report and are not judgmental or subjective in nature:** While some aspects of creating a digital financial report are subjective and therefore judgmental, the minimum criteria are mechanical¹⁹. For example, “Assets = Liabilities and Equity” is in no way judgmental. That equation is a fundamental rule of accounting. Further, the fact that a relation such as this is true for 99% of digital financial reports raises questions as to the practices of the 1% which are not consistent with that rule. This is not to say that every time a minority does something inconsistent that the minority is wrong. It is only one clue. Observing each inconsistency and the nature of the inconsistency and then agreeing whether the inconsistency is a filing error, taxonomy error, or testing error is in order. These minimum criteria form somewhat of a skeleton which the more detailed areas of a financial report build upon. Basically, in order for digital financial reporting to work appropriately these minimum criteria cannot be judgmental or subjective in nature, they must be mechanical.
- **Validation and verification of the minimum criteria are 100% automatable:** The fact that one commercial software vendor is able to detect each of the inconsistencies shown in this analysis proves that these inconsistencies are detectible using machine-based processes. As such, other software vendors could implement these validation/verification steps. The SEC could implement these tests as a hurdle which filers must pass in order to submit their financial information to the SEC. Software vendors could implement these tests to check the digital financial reports their software generates for these errors. These minimum criteria point out the tip of a much larger validation/verification iceberg.
- **Current generation of digital financial report creation software does not adequately help professional accountants detect inconsistencies:** Every digital financial report should be consistent with these minimum criteria and it is the role of software creating this information to manage these issues. Checking for inconsistencies does not need to be performed after a

¹⁹ *Important Issues, Considerations, and Opportunities for Accounting Professionals in Creating the Digital Financial Report*, <http://www.xbrl.org/2015/Library/IssuesAndConsiderationsInCreatingDigitalFinancialReporting.pdf>



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financial report is created, software should help accounting professionals and even guide them in the report creation process.

- **Need for a framework:** Most professional accountants creating digital financial reports today and most guidance provided to assist professional accountants in this endeavor today simply outline some set of tasks which should be performed. These professional accountants have no idea if it is the *right set of tasks* or if they are the *complete set of tasks*. Accountants tend to simply do some set of work, pass all required hurdles which are likewise not comprehensive, and call everything good. The results of this analysis show that this approach will not work. The minimum criteria articulated are a framework. That framework is basic, but it is better than any other framework that I am aware of. The minimum criteria are not being held out as being the comprehensive framework. However, the minimum criteria are highly likely to be a part of any framework someone might create. The minimum criteria are required. They are necessary, but they are not sufficient.
- **Need for a roadmap:** Professional accountants must be able to prove that the work that they have done was comprehensive and covered 100% of what is necessary so that they can stand by their digital financial report as a true and fair representation of their entities financial information. They do that today with paper-based financial reports. They need to be able to do this for digital financial reports. The minimum criteria which I am using yields information about only the economic entity of focus for the current balance sheet date and year-to-date income statement period and for the primary financial statements. This is only a beachhead.
- **My next level of criteria:** The next set of criteria which will be added to and building upon these minimum criteria will include the following:
 - **Required disclosures:** There are a handful of required disclosures which every reporting entity must provide including nature of operations, basis of reporting, and significant accounting policies. Those will be added to my criteria.
 - **Primary financial statement detail:** Many disclosures either provide a disaggregation or other details of information which is contained on the primary financial statement or a roll forward of a line item between two periods. Those will be added to my criteria.
 - **Next layer of unchangeable relations:** Other relations exist at a more detailed level of a financial report. Some examples include Property, plant and equipment, net = Property, plant and equipment, gross – Accumulated depreciation and amortization; Long-term debt = Current portion of long-term debt + Noncurrent portion of long-term debt. There are many other such relations.
- **Any system which desires to implement digital financial reporting can learn from public company XBRL-based digital financial filings:** There is a lot which can be learned by trying to work with XBRL-based public company financial filings submitted to the SEC. Any system which implements digital financial reporting using XBRL or otherwise will have issues similar to these public company XBRL-based reports. This is not to copy, but rather to learn from the mistakes which have been made and avoid those mistakes; while leveraging the good ideas which do work as is desired.

