Arriving at Digital Financial Reporting All Stars: Summary Information

Charles Hoffman, CPA

March 29, 2014

A total of 1,281 digital financial reports, 19% of 6,674 SEC XBRL financial filings (all 10-K submissions), were found to be fundamentally usable when assessed these reports against a set of seven criteria.

The purpose of this document is to summarize information related to arriving at this set of 1,281 fundamentally usable digital financial reports.

Just as craftsmen creating a building understand that making sure the foundation of that building is true and square or a craftsmen constructing furniture understands that keeping right angles exactly 90 degrees is critical; professional accountants understand that getting the foundation of a digital financial report is key to constructing a sound digital financial report. Further, prudence dictates that using financial information in SEC XBRL financial filings should not be a guessing game. If financial information in a digital financial report is not useable, the digital financial report is not created correctly.

Each SEC XBRL financial filing in the set of 1,281 is part of the 10-Ks filed with the SEC between March 1, 2013 and February 28, 2014, basically for fiscal year 2013. There were a total of 6,674 such SEC XBRL financial filings that I worked with after deleting a handful of trusts, funky CIK numbers, and a few other odd but extremely rare things. The point of removing these edge cases was to make working with the filings easier and to narrow the financial reporting patterns to commonly occurring patterns.

So the full set of 6,674 was a repetitive set of very common financial reports filed by public companies that are required to report to the SEC. The set is complete enough and manageable enough to offer a practical yet representative set of digital financial reports.

Each of these SEC XBRL financial filings were evaluated against the same criteria. The criteria are described as a minimum set of criteria which is necessary to use any information contained within an SEC XBRL financial filing. This was determined by actually attempting use this information by extracting it using automated computer processes. Information about this minimum criteria, the raw data of this analysis, and the software algorithm used can be found here on my blog:

http://xbrl.squarespace.com/journal/2014/3/19/updated-minimum-criteria-for-evaluating-sec-xbrl-financial-f.html

Others are encouraged to attempt to repeat this analysis and determine other potentially easier approaches to making use of information reported within SEC XBRL financial filing. The software algorithm provided a very minimal, yet effective as demonstrated by it actually correctly retrieving information. While more sophisticated algorithms could have perhaps been created, the point of the

exercise is not creative programming; the goal is safe, reliable, predictable, automated reuse of reported financial information and what is necessary to provide this reuse.

The following is a summary of the seven minimum criteria used to evaluate these digital financial reports and a summary of the current state of SEC XBRL financial filings in meeting these minimum criteria.

#	Goal or Desired State	Process tests	Current State
1	Consistent XBRL technical syntax	Automated XBRL technical syntax error checks	99.9% meet the criteria of consistent XBRL technical syntax rules and are therefore fundamentally readable documents
2	Consistent EDGAR Filer Manual (EFM) syntax/semantics	Automated EFM syntax and semantics error checks	97.9% meet the criteria of specified automatable SEC EDGAR Filer Manual (EFM) rules
3	Consistent report level structure	Automated model structure error checks	99.9% meet the criteria of consistent and unambiguous report level model structure relations
4	Detectable exonomic entity or accounting entity or "root reporting entity" or "entity of focus"	Successful and unambiguous identification of the "entity of focus"	99.2% provide a detectable "root of reporting entity" so that information can be properly discovered using automated processes
5	Detectable and unambigous 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% provide a detectable and unambiguous current balance sheet date
6	Detectable and unambigous set of fundamental reported facts and intact relations between those fundamental facts which prove trustworthy nature of information	Automated verification checks to be sure fundamental accounting concepts are distinguishable/decipherable and the relations between those fundamental concepts are intact/sound	97.8% consistently report or provide enough information to impute 51 fundamental accounting concepts and those concepts consistently adhere to 21 basic accounting relationships
7	Detectable basic primary financial statement roll up computations are intact which prove trustworthy nature of information	Automated verification checks for existence of business rules which articulate these basic primary financial statement relations and successful passing of these business rules	90.1% provide detectable roll up rules for balance sheet, income statement, cash flow statement

These criteria are discussed in more detail in the document *Understanding Minimum Processing Steps for Effective Use of SEC XBRL Financial Filing Information*. (Contact me if you want a copy, the other author and I are thinking about trying to get this document published so we are not making it widely available at the current time.)

Summary of results

This section provides a brief summary of the results for each 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.

Consistent XBRL technical syntax[1]:

Test	Total filings	% Total Filings
XBRL technical syntax unambigous	6,671	99.96%
XBRL technical syntax errors	3	0.04%
Total	6,674	100.00%

The first aspect of making use of an SEC XBRL financial filing is that the format of the information must be fundamentally and reliably readable by a machine such as a computer. This test shows that 99.96% of all SEC XBRL financial filings are compliant with the global standard XBRL technical syntax format.

This information is provided by the XBRL Cloud EDGAR Dashboard.

Consistent EDGAR Filer Manual (EFM) syntax/semantics[2]:

Test	Total filings	% Total Filings
EFM rules complied with	6,535	97.9%
EFM Errors	139	2.1%
Total	6,674	100.0%

While not every SEC EFM rule is critical to the fundamental use of reported information, some EFM rules are essential. Further, because the rate at which filers comply with EFM rules, the focus will be on areas which are critical. Subsequent sections cover these specific EFM rules.

This information is provided by the XBRL Cloud EDGAR Dashboard.

---

[1] See http://xbrl.squarespace.com/journal/2014/3/17/xbrl-technical-syntax-update-insights-obtained.html
[2] See http://xbrl.squarespace.com/journal/2014/3/18/automated-sec-edgar-filer-manual-efm-update-insights-obtaine.html

Consistent report level structure[3]:

Report perspective:

Reports	Total filings	% Total Filings
Report level model structure unambigous	6,393	95.8%
Report level model structure ambigous	281	4.2%
Total	6,674	100.0%

Report level relations structure are the relations between the categories of pieces which make up a financial report: Network, Table, Axis, Member, LineItems, 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 errors. The table of information below looks at these issues from the perspective of all the relations which exist.

Relationship perspective:

Relationships of report element category	Total relations	Unambigous relations	Undefined or ambigous relations
Networks	477,041	476,854	187
Tables	232,230	232,182	48
Axis	386,912	386,901	11
Member	1,216,391	1,216,253	138
LineItems	232,690	232,531	159
Concepts	3,165,249	3,165,247	2
Abstracts	732,409	732,100	309
Total	6,442,922	6,442,068	854
	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 errors. One is from the perspective of a filing, *how many errors does a filing contain*. Another is from the perspective of *all possible errors which could occur*. So looking at the information above from the perspective of filings, a total of 281 filings had errors, which represented 4.2% of all filings. Looking at this from the perspective of total possible errors, there were a total of 854 errors in all filings, which represented a total of .01% of total possible errors.

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 SEC XBRL financial report. The role of a

---

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

Table, Axis, Member, LineItems, Concept, and Abstract must be understood consistently or the information represented will not be consistently expressed.

Basically 99.99% of the relations between Tables, Axes, Members, LineItems, Concepts, and Abstracts are consistent and therefore unambiguous. A very small majority of relations are potentially ambiguous and even fewer are ambiguous. It is therefore easy to deduce that if you do what 99.99% of filers are doing it is hard to go wrong.

Detectable economic entity or accounting entity or "root reporting entity" or "entity of focus"[4]:

Test	Total filings	% Total Filings
Root or "entity of focus" successfully discovered	6,622	99.2%
Root entity not found	52	0.8%
Total	6,674	100.0%

A machine 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 99.2% of reporting entities follow that criteria and the root economic entity is distinguishable.

Detectable and unambiguous current period balance sheet and income statement period dates[5]:

Test	Total filings	% Total Filings
Balance sheet date unambigous	6,624	99.3%
Balance sheet date ambigous/inconsistent	50	0.7%
Total	6,674	100.0%

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

---

[4] See http://xbrl.squarespace.com/journal/2014/3/18/detecting-economic-entity-or-entity-of-focus-update-insights.html
[5] See http://xbrl.squarespace.com/journal/2014/3/18/detection-of-current-balance-sheet-date-update-insights-obta.html

makes use of the current balance sheet information and year-to-date income statement and cash flow statement information. The EFM rules provide for an easy 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 discernable.

Detectable and unambiguous set of fundamental reported facts and intact relations between those fundamental facts which prove trustworthy nature of information[6]:

Test	Total filings	% Total Filings		Total tests	% Total Tests
All fundamental accounting concepts correct	1,711	26%		332,917	97.8%
Has fundamental accounting concept errors	4,963	74%		7,457	2.2%
Total	6,674	100%		340,374	100.0%

Again, recognizing the difference between the filing perspective and the test perspective, 74% of all filings had zero issues with effectively discovering a reported fundamental accounting concept or imputing the value of such a concept based on other reported information. From the perspective of each individual test, 97.8% of all tests for these fundamental accounting concepts were satisfied.

While the aggregate information is interesting, the detailed information for each test is even more telling. The table below shows the 21 tests of what can be considered relationships which always exist between specific fundamental accounting concepts[7]. Of these relations, 14 of 21 were satisfied by over 95% of all SEC XBRL financial filings. All but three were satisfied by over 90% of all such filings. Only 3 test were below 90%, but even each of those are in the high 87.9% or higher. You can see the results for the individual relation rules in the table below.

---

[6] See http://xbrl.squarespace.com/journal/2014/3/16/fundamental-accounting-concepts-update-insights-obtained.html

[7] For more information on the fundamental accounting concepts and relations between these concepts see http://fundamentalaccountingconcepts.wikispaces.com/

Test	Fundamental accounting relationship (business rule)	Total set	No root entity	Exclude	Total set	Pass test	Percent	Comments	Fail test
BS1	Equity = EquityAttributableToParent + EquityAttributableToNoncontrollingInterest	6,674	52	0	6,622	6,511	98.3%		111
BS2	Assets = LiabilitiesAndEquity	6,674	52	0	6,622	6,593	99.6%		29
BS3	Assets = CurrentAssets + NoncurrentAssets	6,674	52	1,340	5,282	5,163	97.7%	Not all filers have classified balance sheets. Unclassified balance sheets excluded.	119
BS4	Liabilities = CurrentLiabilities + NoncurrentLiabilities	6,674	52	1,340	5,282	5,124	97.0%	Not all filers have classified balance sheets. Unclassified balance sheets excluded.	158
BS5	LiabilitiesAndEquity = Liabilities + CommitmentsAndContingencies+ TemporaryEquity+ Equity	6,674	52	0	6,622	6,367	96.1%		255
IS1	GrossProfit = Revenues - CostOfRevenue	6,674	52	3,345	3,277	2,917	89.0%	Not all filers use multi-step income statement. Exclude developing stage and going concerns	360
IS2	OperatingIncomeLoss = GrossProfit - OperatingExpenses + OtherOperatingIncome	6,674	52	3,345	3,277	2,881	87.9%	Not all filers use multi-step income statement. Exclude developing stage and going concerns	396
IS3	IncomeBeforeEquityMethodInvestments = OperatingIncomeLoss + NonoperatingIncomeLoss + InterestAndDebtExpense	6,674	52	0	6,622	5,843	88.2%		779
IS4	IncomeFromContinuingOperationsBeforeTax = IncomeBeforeEquityMethodInvestments + IncomeFromEquityMethodInvestments	6,674	52	0	6,622	6,415	96.9%		207
IS5	IncomeFromContinuingOperationsAfterTax = IncomeFromContinuingOperationsBeforeTax - IncomeTaxExpenseBenefit	6,674	52	0	6,622	6,269	94.7%		353
IS6	NetIncomeLoss = IncomeFromContinuingOperationsAfterTax + IncomeFromDiscontinuedOperations + ExtraordaryItemsGainLoss	6,674	52	0	6,622	6,243	94.3%		379
IS7	NetIncomeLoss = NetIncomeAttributableToParent + NetIncomeAttributableToNoncontrollingInterest	6,674	52	0	6,622	6,238	94.2%		384
IS8	NetIncomeAvailableToCommonStockholdersBasic = NetIncomeAttributableToParent - PreferredStockDividendsAndOtherAdjustments	6,674	52	0	6,622	6,308	95.3%		314
IS9	ComprehensiveIncome = ComprehensiveIncomeAttributableToParent + ComprehensiveIncomeAttributableToNoncontrollingInterest	6,674	52	0	6,622	6,386	96.4%		236
IS10	ComprehensiveIncome = NetIncomeLoss + OtherComprehensiveIncome	6,674	52	0	6,622	6,430	97.1%		192
CF1	NetCashFlow = NetCashFlowsContinuing + NetCashFlowsDiscontinued + ExchangeGainsLosses	6,674	52	0	6,622	6,369	96.2%	Total of 115 use alternate approach of not including ExchangeGainsLosses in NetCashFlow.	253
CF2	NetCashFlowsContinuing = NetCashFlowsOperatingContinuing + NetCashFlowsInvestingContinuing + NetCashFlowsFinancingContinuing	6,674	52	0	6,622	6,445	97.3%		177
CF3	NetCashFlowsDiscontinued = NetCashFlowsOperatingDiscontinued + NetCashFlowsInvestingDiscontinued + NetCashFlowsFinancingDiscontinued	6,674	52	0	6,622	6,574	99.3%		48
CF4	NetCashFlowsOperating = NetCashFlowsOperatingContinuing + NetCashFlowsOperatingDiscontinued	6,674	52	0	6,622	6,594	99.6%		28
CF5	NetCashFlowsInvesting = NetCashFlowsInvestingContinuing + NetCashFlowsInvestingDiscontinued	6,674	52	0	6,622	6,603	99.7%		19
CF6	NetCashFlowsFinancing = NetCashFlowsFinancingContinuing + NetCashFlowsFinancingDiscontinued	6,674	52	0	6,622	6,615	99.9%		7

Total failed information points		4,804
No information found at all		2,652
Total errors in information		7,456
Total number of information points (6,674 filers X 51 information points)		340,374
Percent of information incorrect:		2.2%
Percent of information CORRECT:		97.8%

While it could be expedient to increase the results by dropping the three tests with passing rates below 90%, the problem with that is that if the tests were dropped then the goal of being able to make user of the reported information would not be achievable. As such these relation tests cannot be dropped.

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 safely, reliably, and predictably; I would argue that it is counterproductive to do so. First, as 87.9% of all SEC XBRL financial filings satisfy these results, arguably getting to the bottom of the specific reasons why the vast minority does not satisfy these test would seem prudent. Second, the fewer guessing games involved with reading this fundamental and foundational information, the safer, more reliable, and more predictable using all the information 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 information[8]:

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	5,211	78.1%
Expected roll up missing	402	429	1,153	671	1,463	21.9%
Total	6,674	6,674	6,674	6,674	6,674	100.0%
Expected roll up WAS discovered	94%	94%	83%	90%	78%	
Expected roll up missing	6%	6%	17%	10%	22%	
Total	100%	100%	100%	100%	100%	

Breakdown by test	Total Tests	% Total Tests
Roll up present	24,041	90.1%
Roll up not present	2,655	9.9%
Total	26,696	100.0%

From the perspective of the filings, 78.1% of all SEC XBRL financial filings provide business rules which document the roll ups of information on the primary financial statements which obviously rolls up. 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 these criteria.

If one were to look at this on a per roll up basis, then 90.1% of all filers provide the required roll up rules which specify how their balance sheet, income statement, and cash flow statement foots.

The most compelling clue that assets, liabilities and equity, net cash flow, and net income do, in fact, roll up is the fact that 90.1% of all situations where one would expect such roll up rules (in the form of XBRL calculation relations) to exist, they do in fact exist.

---

[8] See http://xbrl.squarespace.com/journal/2014/3/18/primary-financial-statement-roll-up-computation-update-insig.html

Summary of All-Stars by generator:

The following table shows the total filings from the set of 6,674 broken down by the generator of the report (software or filing agent), the total number of All-Stars and the percentage of All-Stars (number of All-Stars divided by total filings):

Generator	Total Filings	All Stars	% All Stars
Advanced Computer Innovations	360	6	2%
Compliance Xpressware	92	31	34%
CompSci	431	105	24%
Computershare Communication	4	1	25%
DataTracks	136	40	29%
Diversified Global Graphics	4	0	0%
Doremus	8	1	13%
Edgar Filing	10	3	30%
Edgar Technology	4	3	75%
EDGARbiz	15	6	40%
EDGARizerX	5	0	0%
ETBS	5	0	0%
Ez-Editor	440	100	23%
Ez-XBRL	168	37	22%
Fujitsu Interstage XWand	29	3	10%
GoFiler	523	79	15%
IBM Cognos	135	7	5%
Merrill	508	77	15%
NeoClarus	105	1	1%
Novaworks	256	16	6%
Peak Performance Partners	5	2	40%
QXInteractive	181	24	13%
Rivet	270	51	19%
RR Donnelley/Edgar Online	1,092	292	27%
SAP	6	1	17%
SECUREX Filings	30	9	30%
SmartXBRL	8	0	0%
Thomson Reuters	255	37	15%
Unknown	17	2	12%
Vintage Filings	66	14	21%
WebFilings	1,463	321	22%
XBRLedger	33	9	27%
YES International	1	0	0%
Z-K Global	9	3	33%
Total	6,674	1,281	19%

The primary purpose behind breaking this information out in this manner 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 tests. Today the answer to that question is no.

What I mean is that any software vendor could create a complete set of automatable tests which can be used to verify any SEC XBRL financial filing to make sure that filing passes 100% of these seven minimum criteria. And so the obvious question is: "Why are there no software vendors who take advantage of this fact?"

In my view, there are several reasons why this is not being done. First, this set of seven minimum criteria did not exist until late 2013. Second, many software vendors are implementing these tests. For example, an analysis of the report level model structure rules for filings submitted by Rivet Software revealed that software product satisfied 100% of all report level model structure rules after July 1, 2013. Passing 100% of these tests is what I would expect. Passing 100% of any category is a path to passing all categories. The goals is not some software vendors or some tests, but eventually 100% of software vendors and filing agents satisfy 100% of these seven minimum criteria. That is the point of creating the criteria, so they can be used to increase information quality in SEC XBRL financial filings.

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.

Another key point worth mentioning is that an argument has been made that software vendors should not be held accountable for how SEC filers use, or misuse, their software. My answer to that argument would be to make two points.

First, table saw manufacturers put safety mechanisms in their products to help keep those that use their products do not get injured: guards, breaks which stop the blade from turning, etc. That is the function of the makers of products, to protect their customers. Sure, users can remove guards, disable other safety features and then they become responsible. I would argue that these seven criteria are safety mechanisms which help public companies do their job correctly.

Second, quality is a product differentiator. I would propose that if there were one software vendor which had 100% all-star SEC XBRL financial filings, all filings passing all criteria; then that would be a compelling reason to purchase that product. I would speculate that one day quality will in fact be a differentiator.

Third, automated validation and verification of as much of a digital financial report as possible is desirable because there are so many pieces which must be correct for the digital financial report to be useable and it is impossible to verify all these aspects manually. You can never automate everything, but automating as much as possible is practical, efficient, and cost effective. Why would you not automate as much as possible?

The following information is a summary of all stars by entity filer category:

Entity Filer Category	Total filings per cagetory	All stars per category	Percent of total all stars	Percent of total filings
Accelerated Filer	1,294	291	22.7%	19.4%
Large Accelerated Filer	1,615	318	24.8%	24.2%
Non-accelerated Filer	567	107	8.4%	8.5%
Smaller Reporting Company	3,195	565	44.1%	47.9%
Smaller Reporting Accelerated Filer	3	0	0.0%	0.0%
Total	6,674	1,281	100.0%	100.0%

Summary errors by criteria, by generator:

The following table shows a summary of total errors broken out by criteria (in the columns) and by generator (in the rows). On the far right you can see the "Total Errors", "Total Filings" and "Total Errors / Total Filings". The average error rate per filing is 2.8. Green is better than that average, yellow is worse than that average.

Generator	#1 XBRL Technical Syntax	#2 EFM	#3 Report Level Model Structure	#4 Root Reporting Entity Detection	#5 Balance Sheet Date Consistency	Missing Assets Roll Up	Missing Liabilities and Equity Roll Up	Missing Net Income Roll Up	Missing Net Cash Flow Roll Up	#6 Missing Roll Ups (Total of H, I, J, and K)	#7 Fundamental Accounting Concept Errors	Total Errors	Total Filings	Total Errors / Total Filings
Advanced Computer Innovations	0	3,343	43	7	4	142	149	273	315	879	521	4,797	360	13.3
Compliance Xpressware	0	0	0	0	0	0	0	2	3	5	93	98	92	1.1
CompSci	0	0	10	0	0	17	11	22	36	86	547	643	431	1.5
Computershare Communication	0	0	0	0	0	1	0	0	1	2	5	7	4	1.8
DataTracks	0	0	0	2	2	3	3	4	5	15	150	169	136	1.2
Diversified Global Graphics	0	0	0	0	0	1	0	0	1	2	7	9	4	2.3
Doremus	0	0	0	0	0	0	0	0	0	0	7	7	8	0.9
Edgar Filing	0	1	1	0	0	1	0	0	0	1	15	18	10	1.8
Edgar Technology	0	0	0	0	0	0	0	0	0	0	1	1	4	0.3
EDGARbiz	0	0	1	0	0	0	0	0	0	0	11	12	15	0.8
EDGARizerX	0	3	2	0	0	0	0	1	1	2	11	18	5	3.6
ETBS	0	0	0	0	0	0	0	0	0	0	9	9	5	1.8
Ez-Editor	4	12	25	2	1	20	10	10	29	69	501	614	440	1.4
Ez-XBRL	0	0	23	1	0	23	0	9	9	41	189	254	168	1.5
Fujitsu Interstage XWand	0	12	35	0	1	0	1	0	1	2	40	90	29	3.1
GoFiler	0	2,251	150	6	5	81	89	140	240	550	700	3,662	523	7.0
IBM Cognos	0	0	102	4	5	3	4	3	8	18	279	404	135	3.0
Merrill	0	1	50	0	0	1	1	3	15	20	843	907	508	1.8
NeoClarus	0	0	4	1	1	65	78	100	73	316	136	458	105	4.4
Novaworks	0	219	30	7	5	17	18	40	168	243	356	860	256	3.4
Peak Performance Partners	0	0	0	0	0	0	0	0	1	1	5	6	5	1.2
QXInteractive	0	0	22	2	2	6	2	16	96	120	245	391	181	2.2
Rivet	1	0	0	0	0	1	5	6	4	16	366	383	270	1.4
RR Donnelley/Edgar Online	0	7	54	7	7	7	31	16	20	74	1,274	1,423	1,092	1.3
SAP	0	0	28	0	0	0	0	0	0	0	11	39	6	6.5
SECUREX Filings	0	0	1	0	0	0	0	0	0	0	29	30	30	1.0
SmartXBRL	0	0	128	0	0	2	5	7	8	22	23	173	8	21.6
Thomson Reuters	4	0	27	2	2	0	3	1	18	22	348	405	255	1.6
Unknown	0	48	5	0	0	1	1	2	7	11	27	91	17	5.4
Vintage Filings	0	0	29	0	0	2	0	1	1	4	88	121	66	1.8
WebFilings	0	0	45	11	15	7	18	14	89	128	2,037	2,236	1,463	1.5
XBRLedger	0	0	1	0	0	1	0	1	3	5	35	41	33	1.2
YES International	0	0	0	0	0	0	0	0	0	0	1	1	1	1.0
Z-K Global	0	0	1	0	0	0	0	0	1	1	10	12	9	1.3
Total	9	5,897	817	52	50	402	429	671	1,153	2,655	8,920	18,389	6,674	2.8

The green in the right had columns indicates where a generator has ZERO errors for that criteria. The greener the row, the more criteria are passed 100% by a specific generator. ZERO errors indicates that they software system is likely established to watch over filings to make sure that error does not exist. It could be the case that manual verification is doing a thorough job. In looking at the number of errors, it is important to also consider the number of filings for the generator. Obviously the higher the number of filings a generator creates, the higher the number of possible errors. The average error rate per filing (far right) helps make sense of the information.

Below is a distribution of fundamental accounting concept errors by generator in the rows, by test in the columns. Total fundamental accounting errors[9], the average number of errors per filing, and total filings 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 Errors	Avg per Filing	Total Filings
Advanced Computer Innovations	9	5	8	22	23	33	25	20	2	24	74	26	25	10	8	27	5	6	3	0	1	356	1.0	360
Compliance Xpressware	3	1	6	16	4	1	4	8	4	1	1	2	0	2	1	3	0	0	0	0	0	57	0.6	92
CompSci	10	4	7	10	24	26	24	63	19	18	33	22	14	10	22	16	3	7	3	6	0	341	0.8	431
Computershare Communication	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.5	4
DataTracks	5	0	2	2	9	10	3	14	6	9	4	7	2	4	5	5	2	2	1	1	1	94	0.7	136
Diversified Global Graphics	0	0	0	0	0	0		1	1	1	0	0	0	0	0	0	0	0	0	0	0	3	0.8	4
Doremus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	8
Edgar Filing	0	0	0	0	1	1	2	2	0	0	2	2	0	0	0	2	0	0	0	0	0	12	1.2	10
Edgar Technology	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.3	4
EDGARbiz	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	7	0.5	15
EDGARizerX	0	0	0	0	0	0	1	1	2	2	0	2	0	1	0	0	0	0	0	0	0	9	1.8	5
ETBS	0	0	0	0	1	0	0	2	1	0	0	0	1	1	0	1	0	0	0	0	0	7	1.4	5
Ez-Editor	7	1	5	15	16	17	15	51	15	25	21	14	7	11	17	12	5	0	2	1	0	257	0.6	440
Ez-XBRL	2	3	7	14	9	9	4	25	7	7	6	4	7	1	2	7	0	0	1	0	1	116	0.7	168
Fujitsu Interstage XWand	0	0	1	2	0	1	0	2	0	5	0	2	2	3	1	3	0	0	1	0	0	23	0.8	29
GoFiler	23	6	31	28	31	41	17	61	19	31	44	41	17	9	12	46	16	3	3	3	2	484	0.9	523
IBM Cognos	9	0	0	0	6	11	17	31	5	18	13	19	23	14	14	2	2	1	0	0	0	185	1.4	135
Merrill	4	0	0	1	17	33	33	48	20	21	24	74	97	20	13	6	122	4	0	0	0	537	1.1	508
NeoClarus	4	0	1	7	9	7	2	17	4	8	11	7	7	3	1	5	0	0	0	0	0	93	0.9	105
Novaworks	21	1	10	13	13	17	11	29	7	10	33	14	1	8	4	22	10	0	1	2	1	228	0.9	256
Peak Performance Partners	0	0	0	0	0	0	2	0	0	2	1	0	0	0	0	0	0	0	0	0	0	5	1.0	5
QXInteractive	5	0	4	5	6	6	9	28	8	8	19	17	5	7	4	20	7	2	2	0	0	162	0.9	181
Rivet	3	1	1	4	12	31	28	28	12	18	12	11	12	12	10	1	1	2	1	1	0	201	0.7	270
RR Donnelley/Edgar Online	18	2	2	3	41	49	54	119	48	57	47	54	34	42	41	28	9	4	3	0	0	655	0.6	1,092
SAP	0	0	0	0	0	0	0	0	0	0	0	1	2	2	0	1	0	0	0	0	0	6	1.0	6
SECUREX Filings	2	0	1	1	4	1	1	2	0	1	0	1	0	0	0	0	0	0	0	0	0	14	0.5	30
SmartXBRL	2	0	0	0	0	2	2	3	3	0	1	0	1	1	0	2	0	1	1	1	0	20	2.5	8
Thomson Reuters	3	1	1	0	11	17	12	44	9	28	9	9	7	20	9	6	3	2	2	0	0	193	0.8	255
Unknown	0	0	1	2	2	2	1	3	0	1	0	2	2	1	1	3	0	0	0	0	0	21	1.2	17
Vintage Filings	2	0	1	3	4	3	5	14	6	7	3	3	0	1	4	2	0	1	0	1	0	60	0.9	66
WebFilings	30	2	3	4	63	94	114	206	58	102	72	102	99	105	72	37	44	13	4	3	1	1228	0.8	1,463
XBRLedger	0	0	0	0	0	0	1	8	3	0	1	0	1	0	2	1	0	0	0	0	0	17	0.5	33
YES International	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	1
Z-K Global	1	0	0	0	0	0	1	1	0	1	0	0	0	0	1	0	0	0	0	0	0	5	0.6	9
Total	163	29	92	158	307	412	388	831	259	405	431	436	366	288	244	259	229	48	28	19	7	5399	0.8	6,674

On average SEC XBRL financial filings contained .8 fundamental accounting concept errors.

Note that the total number of errors 5399 differs from the total errors per the fundamental accounting concepts detail summary of 4804, a difference of 595. The reason for this difference is the 52 reports for which no information was found due to an inability to detect the root economic entity (entity of focus) of the report.

Also note that the total number of errors 5399 differs from the total fundamental accounting concept errors of 8920 on the previous graphic which summarizes the total errors by criteria. This difference relates to tests IS2 and IS3. The criteria take a more aggressive stance on evaluating these tests; this summary takes a more lenient approach. The correct approach is not known at this time. This is in the process of being determined. This will be determined by what can be achieved with the software

---

[9] For a description of the relation the test is evaluating see
http://fundamentalaccountingconcepts.wikispaces.com/

algorithm to properly detect this information. Basically, it boils down to the fact that I am not a good enough programmer I believe.

Errors per filing histogram:

This graphic below shows the number of errors in a filing, the number of filings which have that number of errors, total errors, and then cumulative number of errors.

# of Errors per Filing	# of filings with this error count	Total Errors (# of errors per filing X # of filings with this error count)	Cumulative Number of Filings
0	1,281	0	1,281
1	2,293	2,293	3,574
2	1,382	2,764	4,956
3	700	2,100	5,656
4	433	1,732	6,089
5	255	1,275	6,344
6	132	792	
7	63	441	
8	34	272	
9	16	144	
10	13	130	
11	6	66	
12	8	96	
13	2	26	
14	5	70	
15	2	3	

The point of the graphic is to show that a total of 6,344 SEC XBRL financial filings, 95% of the total, have 5 of less errors of the seven minimum criteria used to test these SEC XBRL financial flings. This is important because it shows that there is not that big of a gap between where the vast majority of filings are right now and the point where the filings would be useful for analysis.

Conclusions reached and insights obtained

The analysis of SEC XBRL financial filings is not intended to be a scientific experiment; it was intended to gather useful information. While not a 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 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.

- **Currently 19% of all SEC XBRL financial filings analyzed satisfy minimum criteria and 95% are 5 or fewer errors from meeting criteria**: 1,281 or 19% of satisfy seven minimum criteria for making use of SEC XBRL financial filings. 95% of all filings have between 0 and 5 specifically identifiable errors that, if corrected, would satisfy the seven minimum criteria. Each of these issues is specifically identifiable and understandable.
- **Specific reasons exist for every issue pointed out**: I am not holding out my tests as being 100% correct. I do stand by those tests, such as the fundamental accounting concept relations, until someone proves to me that there is a better way or that there is some specific error which needs to be corrected. 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 SEC XBRL financial filing 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 appropriateness of any issue. For each issue, evidence observed can determine if:
    - A criteria rule is inappropriate and should be changed.
    - A software algorithm for acquiring a reported fact is in error and should be changed.
    - An SEC XBRL financial filing is in error and should be corrected.
- **Using SEC XBRL financial information need not and should not be a guessing game**: The primary conclusion of this exercise is two key points.
    - The first point is to understand that the primary purpose this work was to understand what it takes to fundamentally read any information contained within an SEC XBRL financial filing. The seven criteria are what it takes. This analysis did not define those criteria, the criteria exposed themselves from the ultimate success of making use of SEC XBRL financial filing information.
    - The second point is that reading this information not only should not be a guessing game, it must not be a guessing game. The goal is safe, reliable, predictable, automated reuse of reported financial information. Prudence dictates that using financial information in SEC XBRL financial filings should not be a guessing game.
- **Minimum criteria are not judgmental or subjective in nature**: Some accountants believe that creation of an SEC XBRL digital financial report is judgmental. While there are judgmental

aspects of creating a financial report, digital or otherwise; there are likewise areas which are in no way judgmental or subjective in nature. For example, "Assets = Liabilities and Equity" is in no way judgmental. Further, at this level of reporting it is not even desirable for this information to be judgmental. These seven 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 objective.

- **Validation and verification of the seven criteria are 100% automatable**: The fact that I am able to detect each of the errors detected by this analysis proves beyond the shadow of a doubt that these errors are detectible. As such, other software developers can 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 seven minimum criteria are only the tip of a much larger validation/verification iceberg, yet they clearly make the point as to the possibility and desirability of automating such verification/validation and the ramifications on information quality and therefore information usability.

- **Current generation of digital financial report creation software has systemic issues**: If you look at the section which breaks down the set of 1,281 all-stars by generator you see no one software vendor with 100% all-stars. Quality can be a good product differentiator. I predict that the number of digital financial reporting all-stars next year will be higher. I predict that some software vendors will focus on trying to pass the seven minimum criteria outlined in this document. I predict that one or more software vendors will achieve 100% success in satisfying these minimum criteria. In fact, I believe that eventually being able to meet these seven criteria and many, many other validation/verification criteria will be necessary before business users will even seriously consider using software products. The only reason software vendors get away with these issues today is lack of understanding of the issues by business users. This is already changing. Business users understand more and more.

- **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 the set of tasks is comprehensive; they simply do some set of work, pass all required hurtles which are likewise not comprehensive, and call everything good. The results of this analysis show that this approach will not work. The seven minimum criteria articulated is a framework. That framework is basic, but it is better than any other framework that I am aware of. The seven minimum criteria is not being held out as being comprehensive. However, the seven minimum criteria are a part of any framework. They 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 seven 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 basically a beachhead which, while most submissions allow for the use of a high percentage of this information, only about 19% allow for the use of 100% of this information. Information which is 90% usable or even 95% or 98% usability is of little or no value because the information is not trustworthy. While 100% usability of 100% of information is likely unattainable, it is a goal which should be strived for. There will always be bugs, but information use can get higher and higher. A goal of 99.9% seems reasonable.

- **My next level of criteria**: The next set of criteria which will be added to and building upon these seven minimum criteria are 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.
- **Any system which desires to implement digital financial reporting can learn from SEC XBRL financial filings**: There is a lot which can be learned by trying to work with SEC XBRL financial filings. Any system which implements digital financial reporting using XBRL or otherwise will have issues similar to the SEC XBRL financial filings. It is sensible that anyone desiring to implement XBRL for financial reporting or business reporting where extensibility is allowed to learn from the trail the SEC and US GAAP XBRL taxonomy are blazing. This is not to copy everything that they have done, but rather to learn from the mistakes which they have made and avoid those mistakes; while leveraging the good ideas which do work as is desired.