Campaign to Improve Disclosure Quality of XBRL-based Public Company Financial Reports Submitted to the SEC

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W. Edwards Deming: "It's not enough to do your best; you must know what to do and then do your best[1]."

Executive summary:

- This document outlines an informal, grass roots, market-driven campaign to improve the quality of and understand XBRL-based financial reports.
- This document summarizes information related to the systematic, methodical, deliberate, rigorous analysis of disclosures provided within XBRL-based public company financial reports submitted to the SEC.
- The reason for analysis is to better understand these disclosures and improve the quality and best practices for creating such disclosures.
- Information in this document helps those that desire to improve quality of disclosures to do so.
- The goal of this campaign is to have four software vendors/filing agents that have repeatable processes which generate 99% or greater level of quality per the fundamental accounting concept relations continuity cross checks measurements and 95% or higher level of quality per a set of 65 disclosure mechanics/reporting checklist measurements.
- A result of achieving this goal is to establish processes and procedures that can be used to create zero-defect XBRL-based financial reports[2] that can be institutionalized by organizations.
- A result of achieving this goal is increased knowledge and skills for professional accountants related to creating and reviewing XBRL-based financial reports.

[1] AZ Quotes, http://www.azquotes.com/quote/531803

[2] Blueprint for Creating Zero-Defect XBRL-based Digital Financial Reports, http://xbrlsite.azurewebsites.net/2017/Library/BlueprintForZeroDefectDigitalFinancialReports.pdf

1.1. Builds on Successful Results of Prior Campaign

On about April 2014[3] I began a process to analyze what became the fundamental accounting concept relations continuity cross checks. Between that time and now, the quality of XBRL-based financial reports submitted to the U.S. Securities and Exchange Commission (SEC) as measured by these fundamental accounting concept relations has increased significantly.

The graphic below shows data from these measurements as of March 31 2015, 2016, and 2017[4]:

March 31, 2015 (Last 10-K filed, FY 2014)

Generator	Filings Count	Filings With No Errors	Sum Errors (all filings)	Average Errors per Filing	Percent Without Error
Trintech	1	1	0	.0	100%
SAP Disclosure Management	4	3	1	.3	75%
RR Donnelley	947	687	376	.4	73%
Compliance Xpressware	83	55	43	.5	66%
P3 Data Systems	199	131	107	.5	66%
DataTracks	400	247	246	.6	62%
CompSci	413	254	237	.6	62%
Ez-XBRL	331	203	196	.6	61%
Unknown	34	20	25	.7	59%
Rivet	230	135	161	.7	59%
Workiva (WebFilings)	1,925	1,090	1,315	.7	57%
Merrill	476	263	297	.6	55%
Accelus	196	106	135	.7	54%
NeoClarus	93	49	85	.9	53%
Novaworks Software	551	285	455	.8	52%
Oracle	2	1	2	1.0	50%
GoXBRL	269	132	233	.9	49%
QXi	156	75	131	.8	48%
IBM Cognos	100	47	92	.9	47%
Advanced Computer Innovations	323	143	310	1.0	44%
SmartXBRL	5	2	5	1.0	40%
Thunderdome	0	0	0	.0	0%
EDGARfilings PROfile	0	0	0	.0	0%
Fujitsu	13	5	11	.8	38%
	6,751	3,934	4,463	.7	

Percent of all filings conforming to all FAC relations		58.3%
Total filings NOT conforming	2,817	

Total tests	148,522	100.00%
Total inconsistent	4,463	3.00%
Total consistent	**144,059**	**97.00%**

March 31, 2016 (Last 10-K or 10-Q filed)

Generator	Filings Count	Filings With No Errors	Sum Errors (all filings)	Average Errors per Filing	Percent Without Error
Merrill	459	444	15	.0	97%
Certent (was Rivet)	198	186	20	.1	94%
DataTracks	378	354	33	.1	94%
RR Donnelley	898	827	85	.1	92%
P3 Data Systems	79	72	7	.1	91%
Compliance Xpressware	63	57	8	.1	90%
SAP Disclosure Management	7	6	1	.1	86%
Ez-XBRL	335	287	74	.2	86%
Thunderdome	212	177	44	.2	83%
Fujitsu	10	8	2	.2	80%
CompSci	186	147	57	.3	79%
IBM Cognos	66	51	21	.3	77%
Workiva (WebFilings)	2,103	1,624	665	.3	77%
EDGARfilings PROfile	143	109	46	.3	76%
Unknown	8	6	2	.3	75%
Novaworks Software	641	470	284	.4	73%
GoXBRL	262	184	133	.5	70%
QXi	110	74	62	.6	67%
Zenhancer	6	4	5	.8	67%
S2 Filings	60	40	28	.5	67%
NeoClarus	75	50	45	.6	67%
Advanced Computer Innovations	278	185	174	.6	67%
SmartXBRL	6	3	4	.7	50%
Oracle	1	0	1	1.0	0%
	6,584	5,365	1,816	.3	

Percent of all filings conforming to all FAC relations		81.5%
Total filings NOT conforming	1,219	

Total tests	144,848	100.00%
Total inconsistent	1,816	1.25%
Total consistent	**143,032**	**98.75%**

March 31, 2017 (Last 10-K or 10-Q filed)

Generator	Filings Count	Filings With No Errors	Sum Errors (all filings)	Average Errors per Filing	Percent Without Error
NeoClarus	1	1	0	.0	100%
Fujitsu	5	5	0	.0	100%
RR Donnelley	773	759	16	.0	98%
DataTracks	300	293	11	.0	98%
Merrill	417	405	15	.0	97%
Thunderdome	291	281	14	.0	97%
Compliance Xpressware	43	41	2	.0	95%
Certent (was Rivet)	171	162	13	.1	95%
EDGARfilings PROfile	114	107	8	.1	94%
Unknown	44	41	4	.1	93%
IBM Cognos	49	44	6	.1	90%
Ez-XBRL	310	262	70	.2	85%
S2 Filings	70	59	16	.2	84%
Workiva (WebFilings)	2,148	1,803	465	.2	84%
CompSci	73	60	25	.3	82%
GoXBRL	291	230	98	.3	79%
QXi	99	75	30	.3	76%
Novaworks Software	646	485	281	.4	75%
Advanced Computer Innovations	213	143	136	.6	67%
SAP Disclosure Management	6	4	2	.3	67%
Vistalytics	54	34	30	.6	63%
P3 Data Systems	3	1	3	1.0	33%
SmartXBRL	14	4	28	2.0	29%
Zenhancer	0	0	0	.0	100%
	6,135	5,299	1,273	.2	

Percent of all filings conforming to all FAC relations		86.4%
Total filings NOT conforming	836	

Total tests	134,970	100.00%
Total inconsistent	1,273	0.94%
Total consistent	**133,697**	**99.06%**

The most current data coming from measurements as of August 31, 2017[5], show that at that point in time:

- 88.2% of all XBRL-based financial reports created by public companies and submitted to the SEC are consistent with all the fundamental accounting concept relations continuity cross checks.
- 99.2% of all reported facts in such financial reports are consistent with the machine-readable business rules used for these measurements.
- 5 software vendors/filing agents creating such XBRL-based reports which are submitted to the SEC have created repeatable processes which yield rates where 99% of the reports they create are consistent with business rules used.
- 1,059 inconsistencies exist as of the last measurement as contrast to 4,463 inconsistencies that existed in March 2015, a decrease in inconsistencies of almost 75%.

[3] Summary Information from Evaluating SEC XBRL Financial Filings Against Minimum Criteria, http://xbrl.squarespace.com/journal/2014/4/3/summary-information-from-evaluating-sec-xbrl-financial-filin.html

[4] For a larger image see, http://xbrlsite.azurewebsites.net/2017/Library/Compare_2017_2016_2015.jpg

[5] Quarterly XBRL-based Public Company Financial Report Quality Measurement, http://xbrl.squarespace.com/journal/2017/9/1/quarterly-xbrl-based-public-company-financial-report-quality.html

- 9 software vendors/filing agents create 90% of their reports or higher that are consistent with all business rules now, as contrast to 1 software vendor/filing agent in 2015.

As W. Edwards Deming said, "The ultimate purpose of collecting the data is to provide a basis for action or a recommendation."[6] The purpose of collecting this data by taking measurements of the fundamental accounting concept relations is to understand how to create XBRL-based financial reports, how to create machine-readable business rules to automate processes for making sure such reports are created correctly, and to contribute to increasing the quality of such XBRL-based financial reports.

(Data as of August 31, 2017)

August 31, 2017 (Last 10-K or 10-Q filed)

Generator	Filings Count	Filings With No Errors	Sum Errors (all filings)	Average Errors per Filing	Percent Without Error
SAP Disclosure Management	5	5	0	.0	100%
Merrill	406	402	4	.0	99%
Thunderdome (RDG Filings)	293	290	3	.0	99%
Donnelley Financial Solutions	792	783	10	.0	99%
DataTracks	263	260	4	.0	99%
IBM Cognos	43	42	1	.0	98%
EDGARfilings PROfile	107	104	6	.1	97%
Certent (was Rivet)	158	153	6	.0	97%
Compliance Xpressware	37	35	2	.1	95%
CompSci	69	61	12	.2	88%
Workiva (WebFilings)	2,141	1,874	347	.2	88%
S2 Filings	77	67	18	.2	87%
Ez-XBRL	304	263	63	.2	87%
P3 Data Systems	6	5	2	.3	83%
QXi	96	78	24	.3	81%
GoXBRL	260	198	94	.4	76%
Novaworks Software	688	516	281	.4	75%
Fujitsu	4	3	1	.3	75%
Advanced Computer Innovations	236	158	127	.5	67%
Vistalytics	9	5	7	.8	56%
Unknown	4	2	5	1.3	50%
SmartXBRL	17	3	42	2.5	18%
Zenhancer	0	0	0	.0	100%
NeoClarus	0	0	0	.0	100%
	6,015	5,307	1,059	.2	

Percent of all filings conforming to all FAC relations		88.2%
Total filings NOT conforming	708	
Total tests	132,330	100.00%
Total inconsistent	1,059	0.80%
Total consistent	**131,271**	**99.20%**

The fundamental accounting concept relations continuity cross checks impact the entire XBRL-based financial report, making sure information conveyed is consistent and not

[6] AZ Quotes, http://www.azquotes.com/quote/610485

contradictory within and throughout such financial reports. These checks impact the entire report but mostly the primary financial statements.

The next step in this journey is to do the same things for the remaining parts of an XBRL-based financial report: the disclosures.

This document provides information related to the detection and correction of errors that exist in the disclosures of XBRL-based financial reports that are submitted to the SEC by public companies. This information should be useful to software vendors, filing agents, or public companies who desire to increase the quality of such reports by detecting and correcting errors that exist.

It is anticipated that the quality improvement that will be realized from this campaign to improve the quality of disclosures in XBRL-based financial reports of public companies submitted to the SEC will be significant.

1.2. Arriving at a Set of Disclosures

One of the first steps of this campaign is to arrive at a set of disclosures which will be used to test and measure. It would be impossible to create rules for 100% of disclosures in 100% of all reports that public companies create and submit to the SEC. Ultimately, that complete set will be created.

For now, we needed to have a set that was significant enough to have impact, small enough to be manageable, comprehensive and thorough enough to create and test software adequately, and be fundamental enough that there is no real disagreement with the business rules used to test disclosures.

Finally, we wanted to be able to successfully create rules so we avoided known errors in the US GAAP XBRL Taxonomy, mainly missing Level 3 Disclosure Text Block concepts.

As such, this is the set of disclosures that I came up with in alphabetic order:

#	Disclosure
1	Accounts, Notes, Loans and Financing Receivable [Roll Up]
2	Accounts Payable and Accrued Liabilities [Roll Up]
3	Accrued Liabilities [Roll Up]
4	Accumulated Other Comprehensive Income (Loss), by Equity Component [Roll Forward]
5	Allocation of Plan Assets [Hierarchy]
6	Allowance for Credit Losses on Financing Receivables [Roll Forward]
7	Asset Retirement Obligation, by Legal Entity [Roll Forward]
8	Assets [Roll Up]
9	Balance Sheet
10	Basis of Reporting Note [Note Level]
11	Cash Flow Statement [Roll Forward]
12	Deferred Tax Assets and Liabilities [Roll Up]
13	Defined Benefit Plan, Change in Benefit Obligation, by Plan [Roll Forward]
14	Defined Benefit Plan, Change in Fair Value of Plan Assets [Roll Forward]
15	Document and Entity Information [Hierarchy]
16	Document Information [Hierarchy]
17	Effective Income Tax Rate, Continuing Operations, Tax Rate Reconciliation [Roll Up]
18	Entity Information, by Legal Entity [Hierarchy]
19	Expected Benefit Payments [Hierarchy]
20	Fair Value, Assets Measured on Recurring Basis, Unobservable Input Reconciliation [Roll Forward]
21	Finite-lived Intangible Assets, Estimated Useful Lives, by Major Class [Hierarchy]
22	Future Minimum Payments Due under Operating Leases of Lessee [Roll Up]
23	Future Minimum Payments, Present Value of Net Minimum Payments, Noncancelable Capital Leases, Lessor [Roll Up]
24	Future Minimum Payments Receivable of Capital Leases, Lessor [Roll Up]
25	Future Minimum Payments Receivable of Operating Leases of Lessor [Roll Up]
26	Goodwill [Roll Forward]

27	Income before Income Tax, Domestic and Foreign [Roll Up]
28	Income Statement, by Legal Entity [Roll Up]
29	Income Tax Contingency, Unrecognized Tax Benefits [Roll Forward]
30	Income Tax Expense (Benefit) Details [Roll Up]
31	Intangible Assets, Finite-lived, Future Amortization Expense [Hierarchy]
32	Intangible Assets, Finite-lived, Future Amortization Expense [Roll Up]
33	Intangible Assets, Finite-lived, Net, by Major Class [Roll Up]
34	Intangible Assets, Indefinite-lived, by Major Class [Roll Up]
35	Interest and Other Income [Roll Up]
36	Inventory, Net (Current) [Roll Up]
37	Liabilities and Equity [Roll Up]
38	Long-Lived Assets in Individual Foreign Countries, by Geographic Area [Hierarchy]
39	Long-term Debt Instruments, by Instrument [Hierarchy]
40	Long-term Debt Maturities [Hierarchy]
41	Long-term Debt Maturities [Roll Up]
42	Nature of Operations Note [Note Level]
43	Net Periodic Benefit Costs, by Plan [Roll Up]
44	Other Assets, Noncurrent [Roll Up]
45	Other Liabilities, Noncurrent [Roll Up]
46	Other Nonoperating Income (Expense), by Legal Entity [Roll Up]
47	Pension Plans or Other Employee Benefit Plans Assumptions Used, by Plan [Hierarchy]
48	Product Warranty Liability [Roll Forward]
49	Property, Plant and Equipment, Net, by Type [Roll Up]
50	Property, Plant and Equipment, Net, by Type [Roll Up] (Axis/Member style)
51	Property, Plant and Equipment Useful Lives, by Type [Hierarchy]
52	Restructuring Charges [Roll Up]
53	Restructuring Reserve, by Type of Cost [Roll Up]
54	Revenue from External Customers Attributed to Foreign Countries, by Geographic Area [Hierarchy]
55	Revenue Recognition Policy [Policy Text Block]
56	Share-based Compensation Arrangements, by Award [Roll Forward]
57	Share-based Compensation, Restricted Stock Units Award Activity, Weighted Average Price [Roll Forward Info]
58	Share-based Payment Award, Stock Options, Valuation Assumptions [Hierarchy]
59	Significant Accounting Policies Note [Note Level]
60	Statement of Changes in Equity [Roll Forward]
61	Statement of Comprehensive Income [Roll Up]
62	Statement of Income and Comprehensive Income [Roll Up]
63	Unrecognized Tax Benefits, Excluding Amounts Pertaining to Examined Tax Returns [Roll Forward]
64	Warrants or Rights Issued [Hierarchy]

1.3. Best Practice Examples of Each Disclosure

A next step was to create a best practices example of each disclosure[7]. These best practice examples provide positive examples that show what a correct disclosure looks like. These best practice examples are used to both understand how to create a disclosure correctly and to create machine-readable business rules for testing each dislosure.

The best practice examples are summarized on the referenced web page:

[7] Best Practice Examples of Disclosures, http://www.xbrlsite.com/site1/2017/Prototypes/DisclosureAnalysis/All/Index.html

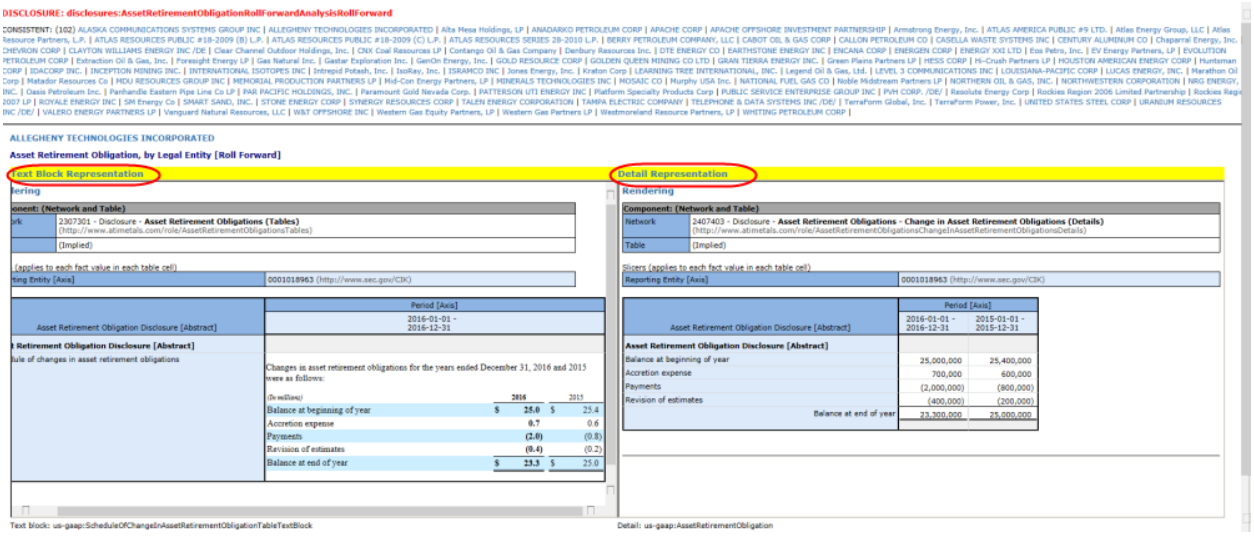
Best Practice Examples of Disclosures for Campaign to Improve Disclosure Quality

Provides a summary of best practice examples of the Level 3 Disclosure Text Block and Level 4 Disclosure Detail from XBRL-based public company financial filings to the SEC for each of the listed disclosures. Note that this is a work in progress and will be improved over time. Note that you can CLICK on the Text Block or Detail headers to view the disclosure in the XBRL Cloud Viewer.

1. **Asset Retirement Obligation Roll Forward** - disclosures:AssetRetirementObligationRollForwardAnalysisRollForward
2. **Future Estimated Amortization of Finite-lived Intangible Assets Roll Up** - disclosures:FiniteLivedIntangibleAssetsFutureAmortizationExpenseRollUp
3. **Inventory Components Roll Up** - disclosures:InventoryNetRollUp
4. **Long-term Debt Maturities Roll Up** - disclosures:LongTermDebtMaturities
5. **Long-term Debt Maturities as Hierarchy (no total, not best practice)** - disclosures:LongTermDebtMaturities2
6. **Property, Plant, and Equipment Components Roll Up (using Members)** - disclosures:PropertyPlantAndEquipmentNetByType2
7. **Property, Plant, and Equipment Components Roll Up (using Line Items)** - disclosures:PropertyPlantAndEquipmentNetByTypeRollUp
8. **Future Minimum Lease Payments Under Operating Lease Agreements Roll Up** - disclosures:OperatingLeasesFutureMinimumPaymentsDueRollUp
9. **Unrecognized Tax Positions Excluding Amounts Related to Examined Tax Returns Roll Forward** - disclosures:UnrecognizedTaxBenefitsExcludingAmountsPertainingToExaminedTaxReturnsRollForward
10. **Income Tax Contingency (this seems to be an ERROR in the use of the text block)** - disclosures:IncomeTaxContingency
11. **Reconciliation of Statutory Tax Rate to Effective Tax Rate Roll Up** - disclosures:EffectiveIncomeTaxRateContinuingOperationsTaxRateReconciliationRollUp
12. **Goodwill, by Segment, Roll Forward** - disclosures:GoodwillRollForward
13. **Finite-lives Intangible Assets Components Roll Up** - disclosures:FiniteLivedIntangibleAssetsNetRollUp
14. **Income (Loss) Before Income Taxes by Domestic and Foreign Roll Up** - disclosures:IncomebeforeIncomeTaxDomesticAndForeign
15. **Income Tax Expense (Benefit) Components Roll Up** - disclosures:IncomeTaxExpenseBenefitDetails
16. **Product Warranty Liability Accrual Roll Forward** - disclosures:ProductWarrantyLiability
17. **Other Noncurrent Liabilities Components Roll Up** - disclosures:OtherLiabilitiesNoncurrentHierarchy
18. **Accrued Liabilities, Current, Components Roll Up** - disclosures:AccruedLiabilities
19. **Other Noncurrent Assets Components Roll Up** - disclosures:OtherAssetsNoncurrent
20. **Allowance for Doubtful Accounts of Financing Type Receivables Roll Forward** - disclosures:AllowanceForCreditLossesonFinancingReceivables
21. **Receivables Components Roll Up** - disclosures:AccountsNotesLoansAndFinancingReceivable
22. **Accounts Payable and Accrued Liabilities, Current, Components Roll Up** - disclosures:AccountsPayableAndAccruedLiabilitiesRollUp

[CSH: Note that these best practice examples will be put into order and will be synchronized to the master list. Currently this is a work in progress and the order is somewhat random based on when the examples were created.]

Each disclosure has its own page which looks like the following example[8]:



From that page you can see between on average 50 and 150 best practice examples for each of the disclosures which will be evaluated.

You can see the Level 3 Disclosure Text Block[9]:

[8] Page for one disclosure, http://www.xbrlsite.com/site1/2017/Prototypes/DisclosureAnalysis/All/Index_724_Consistent.html

[9] Page for example Level 3 Disclosure Text Block, http://www.xbrlsite.com/site1/2017/Prototypes/DisclosureAnalysis/All/0001018963-17-000007_724_T.html

Asset Retirement Obligation Disclosure [Abstract]	Period [Axis] 2016-01-01 - 2016-12-31
Asset Retirement Obligation Disclosure [Abstract]	
Schedule of changes in asset retirement obligations	Changes in asset retirement obligations for the years ended December 31, 2016 and 2015 were as follows: *(In millions)* **2016** 2015 Balance at beginning of year **$ 25.0** $ 25.4 Accretion expense **0.7** 0.6 Payments **(2.0)** (0.8) Revision of estimates **(0.4)** (0.2) Balance at end of year **$ 23.3** $ 25.0

You can see the Level 4 Disclosure Detail[10]:

Asset Retirement Obligation Disclosure [Abstract]	Period [Axis] 2016-01-01 - 2016-12-31	 2015-01-01 - 2015-12-31
Asset Retirement Obligation Disclosure [Abstract]		
Balance at beginning of year	25,000,000	25,400,000
Accretion expense	700,000	600,000
Payments	(2,000,000)	(800,000)
Revision of estimates	(400,000)	(200,000)
Balance at end of year	23,300,000	25,000,000

These matching sets are used to justify the business rules used to test the disclosures and serve as BEST PRACTICE examples of disclosures.

[CSH: Note that XBRL Cloud provides these renderings. Unfortunately, you cannot click on the report elements or facts to see details. If you want that functionality, please discuss this with XBRL Cloud.]

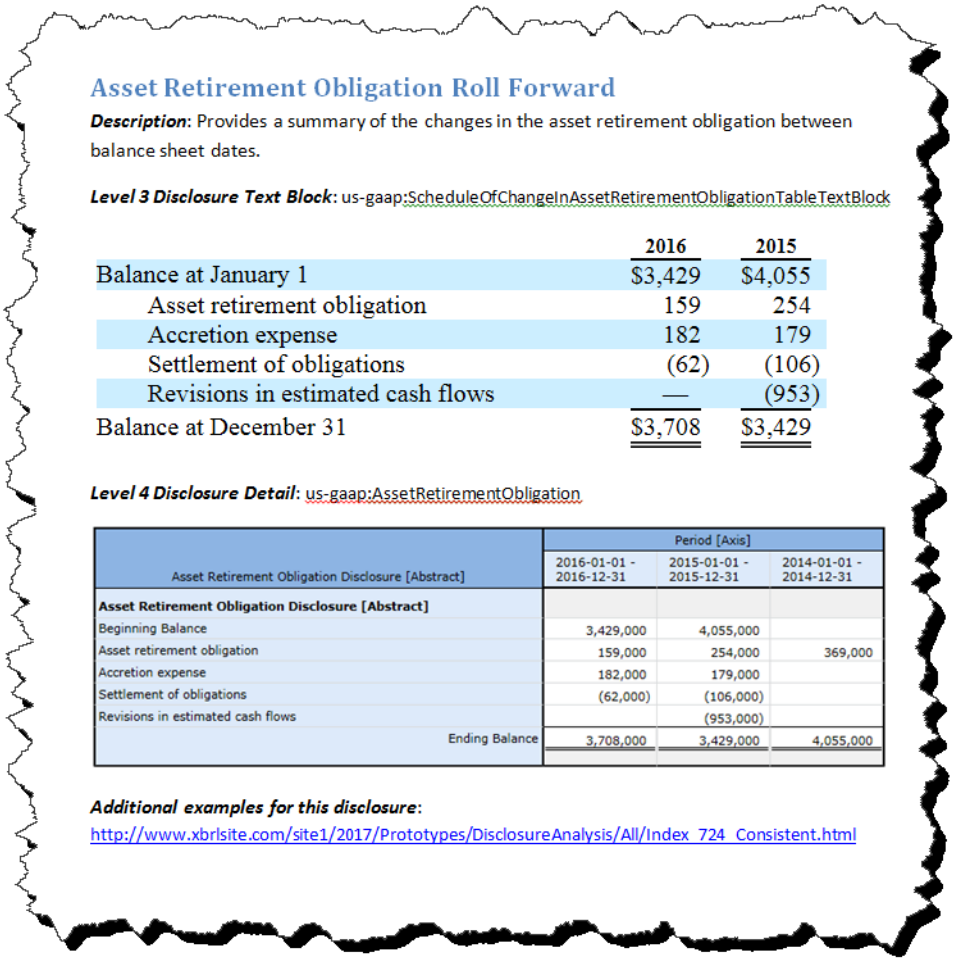
1.4. Documentation for Each Disclosure

In addition to web-based documentation above, I am also creating a proof of concept for a resource intended to be used by intermediate accounting students related to disclosure best practices[11]. This document contains the following for each disclosure:

- Name of the disclosure
- Description of the disclosure
- Level 3 Disclosure Text Block name and example
- Level 4 Disclosure Detail required concept and example
- Link to the best practice examples for the disclosure

[10] Page for example Level 4 Disclosure Detail, http://www.xbrlsite.com/site1/2017/Prototypes/DisclosureAnalysis/All/0001018963-17-000007_724_D.html

[11] Intermediate Accounting Resource, Disclosure Best Practices, http://www.xbrlsite.com/site1/2017/Prototypes/DisclosureAnalysis/DisclosureBestPractices.pdf



Asset Retirement Obligation Roll Forward

Description: Provides a summary of the changes in the asset retirement obligation between balance sheet dates.

Level 3 Disclosure Text Block: us-gaap:ScheduleOfChangeInAssetRetirementObligationTableTextBlock

	2016	2015
Balance at January 1	$3,429	$4,055
Asset retirement obligation	159	254
Accretion expense	182	179
Settlement of obligations	(62)	(106)
Revisions in estimated cash flows	—	(953)
Balance at December 31	$3,708	$3,429

Level 4 Disclosure Detail: us-gaap:AssetRetirementObligation

Asset Retirement Obligation Disclosure [Abstract]	Period [Axis]		
	2016-01-01 - 2016-12-31	2015-01-01 - 2015-12-31	2014-01-01 - 2014-12-31
Asset Retirement Obligation Disclosure [Abstract]			
Beginning Balance	3,429,000	4,055,000	
Asset retirement obligation	159,000	254,000	369,000
Accretion expense	182,000	179,000	
Settlement of obligations	(62,000)	(106,000)	
Revisions in estimated cash flows		(953,000)	
Ending Balance	3,708,000	3,429,000	4,055,000

Additional examples for this disclosure:
http://www.xbrlsite.com/site1/2017/Prototypes/DisclosureAnalysis/All/Index_724_Consistent.html

1.5. Digital Financial Report Creation Best Practices

The resource *Digital Financial Reporting Creation Best Practices*[12] is a document which is useful for understanding how to create high-quality XBRL-based financial reports. The document summarizes basic information that you need to know to properly understand such reports, how to create them properly, how to test them properly, and other helpful information. This document lays out a framework and theory related to the creation of XBRL-based digital financial reports.

Other resources helpful in understanding digital financial reports include:

1. Introduction to the Multidimensional Model for Professional Accountants[13]
2. Introduction to the Conceptual Model of an XBRL-based Digital Financial Report[14]
3. Digital Financial Reporting General Principles[15]

[12] *Digital Financial Reporting Best Practices*, http://xbrlsite.azurewebsites.net/2017/IntelligentDigitalFinancialReporting/Part03_Chapter06.5_DigitalFinancialReportCreationBestPractices.pdf

[13] Introduction to the Multidimensional Model for Professional Accountants, http://xbrl.squarespace.com/journal/2016/3/18/introduction-to-the-multidimensional-model-for-professional.html

[14] Introduction to the Conceptual Model of an XBRL-based Digital Financial Report, http://xbrlsite.azurewebsites.net/2017/IntelligentDigitalFinancialReporting/Part02_Chapter05.1_IntroductionToTheConceptualModelOfDigitalFinancialReport.pdf

4. Blueprint for Creating Zero-Defect XBRL-based Digital Financial Reports[16]
5. Understanding Mechanical Rules of Disclosures[17]

1.6. Software for Testing Fundamental Accounting Concept Relations, Disclosure Mechanics, and Reporting Checklist

There are two software products that are available that can help you test financial reports against the fundamental accounting concept relations continuity cross check rules and the disclosure mechanics and reporting checklist rules.

The first software product is a commercially available product made available by XBRL Cloud[18]. XBRL Cloud makes some software products are available for a fee, others are available for free such as the XBRL Cloud Edgar Dashboard[19].

The second software product is a working and stable commercial quality proof of concept software application called Pesseract[20]. Pesseract will ultimately be an expert system for creating XBRL-based digital financial reports. It was created to prove the concept that such a tool can be built and to create the business rules processing capabilities necessary for such a software application. Pesseract uses the idea of human skills augmented by software capabilities[21].

Pesseract has functionality that is currently very useful for performing batch mode validation of XBRL-based reports. However, it is not a commercial product. For more information about Pesseract please contact me.

The primary advantage that both the XBRL Cloud and Pesseract products offer which is different than most software vendors is supplemental level validation of the semantics of the meaning conveyed by the information within an XBRL-based digital financial report. The processing is built on top of XBRL processors, XBRL Dimensions processors, and XBRL Formula processors; supplementing and extending the global standard specified by XBRL International. These capabilities are achieved using forward chaining model-based business rules processors that are built specifically to process XBRL-based business reports and financial reports.

1.7. Example Functionality

I have worked with both XBRL Cloud and Pesseract to help them create the disclosure mechanics and reporting checklist processing.

XBRL Cloud has made this prototype available[22]. The software is easy for professional accountants to use and functionality will likely improve.

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[15] Digital Financial Reporting General Principles, http://xbrlsite.azurewebsites.net/2017/IntelligentDigitalFinancialReporting/Part01_Chapter02.2_Principles.pdf

[16] Blueprint for Creating Zero Defect XBRL-based Digital Financial Reports, http://xbrlsite.azurewebsites.net/2017/Library/BlueprintForZeroDefectDigitalFinancialReports.pdf

[17] Understanding the Mechanical Rules of Disclosures, http://xbrl.squarespace.com/journal/2016/7/18/understanding-the-mechanical-rules-of-disclosures.html

[18] XBRL Cloud, https://www.xbrlcloud.com/

[19] XBRL Cloud Edgar Dashboard, https://edgardashboard.xbrlcloud.com/

[20] Pesseract, http://pesseract.azurewebsites.net/

[21] Getting Ready for the Digital Age of Accounting, Reporting and Auditing: a Guide for Professional Accountants, http://xbrlsite.azurewebsites.net/2017/Library/GettingReadyForTheDigitalAgeOfAccounting.pdf

[22] XBRL Cloud Tool (Prototype) for validating disclosure mechanics and reporting checklist, http://xbrlsite.azurewebsites.net/2017/Prototypes/DisclosureMechanicsExample/DisclosureMechanicsAndReportingChecklist.html

Disclosure Mechanics and Reporting Checklist

Entity Registrant Name:	MICROSOFT CORPORATION	Document Type:	10-K
CIK:	0000789019	Fiscal Year / Period:	2017 / FY

Disclosures Found: **40 of 67 (60%)**

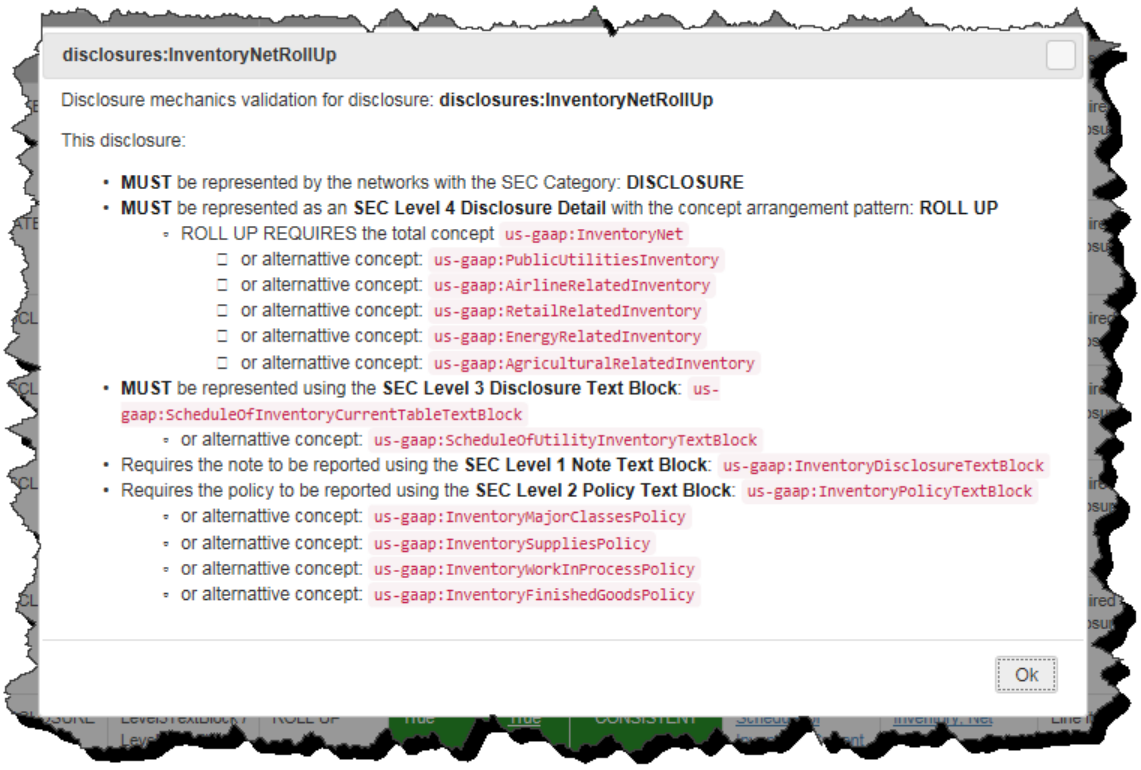
Disclosures Consistent: **66 of 67 (99%)** | Disclosures Inconsistent: **1 of 67 (1%)**

Show: (•) All ( ) Only Consistencies ( ) Only Inconsistencies ( ) Only Not Reported

[ ] Show Level 1 Note And Policy Concept Columns

#	Disclosure	Category	Level	Pattern	Applicable	Found	Disclosure Consistent	Representation Concept [TEXT BLOCK]	Representation Concept [DETAIL]	Checklist Category	Reason
1	Document Information [Hierarchy]	DOCUMENT	Level4Detail	HIERARCHY	True	True	CONSISTENT	NOT-EXPECTED	Document Fiscal Period Focus	Required disclosure	Disclosure always required
2	Document and Entity Information [Hierarchy]	DOCUMENT	Level4Detail	HIERARCHY	False	True	CONSISTENT	NOT-EXPECTED	Entity Registrant Name	Alternative representation	Not necessary, satisfied by Document Information [Hierarchy] disclosure
3	Entity Information, by Legal Entity [Hierarchy]	DOCUMENT	Level4Detail	HIERARCHY	True	True	CONSISTENT	NOT-EXPECTED	Entity Registrant Name	Required disclosure	Disclosure always required
4	Document and Entity Information [Hierarchy]	DOCUMENT	Level4Detail	HIERARCHY	False	True	CONSISTENT	NOT-EXPECTED	Entity Registrant Name	Alternative representation	Not necessary, satisfied by Entity Information, by Legal Entity [Hierarchy] disclosure
5	Balance Sheet	STATEMENT	Level4Detail	COMPONENT	True	True	CONSISTENT	NOT-EXPECTED	NOT-EXPECTED	Required disclosure	Disclosure always required, satisfied by
6	Assets [Roll Up]	STATEMENT	Level4Detail	ROLL UP	True	True	CONSISTENT	NOT-EXPECTED	Assets	Part of disclosure	
7	Liabilities and Equity [Roll Up]	STATEMENT	Level4Detail	ROLL UP	True	True	CONSISTENT	NOT-EXPECTED	Liabilities and Equity	Part of disclosure	
8	Income Statement, by Legal Entity [Roll Up]	STATEMENT	Level4Detail	ROLL UP	True	True	CONSISTENT	NOT-EXPECTED	Net Income (Loss) Attributable to Parent	Required disclosure	Disclosure always required

All business rules are easy for business professionals to read and understand. While business rules are physically represented in the form of XBRL definition relations, the business rules are converted to an easy to understand natural language format for use by business professionals. The following is an example of one business rule for the logical, structural, and mathematical relations of one disclosure:



1.8. Deciding on the Disclosure Business Rules

The document *Supply Chain Agreeing on Disclosure Business Rules*[23] explains the process for deciding on and agreeing on business rules used to evaluate disclosures.

1.9. Campaign to Improve Disclosure Quality Goal

There are four software vendors/filing agents that (a) have achieved the level where 99% of the XBRL-based public company financial reports that they create are consistent with all of the fundamental accounting concept relations, (b) have a significant number of filings, (c) they appear to be able to repeat their processes each quarter and maintain quality levels. Those software vendors/filing agents are:

- Merrill
- Thunderdome (RDG Filings)
- Donnelley Financial Solutions (was RR Donnelley)
- DataTracks

This is not to say that others cannot create processes that achieve repeatable high-quality results. This is also not to say that the results of these software vendors and filing agents are without flaw. So far, only a portion of XBRL-based reports can be measured accurately. Basically, these software vendors/filing agents do a good job, they appear motivated to improve quality, and they have demonstrated they can institutionalize processes. The latest results of the fundamental accounting concept relations continuity cross checks is empirical evidence that proves that quality can both be increased and processes applied that can be repeated. See the latest measurement results here[24]:

August 31, 2017 (Last 10-K or 10-Q filed)

Generator	Filings Count	Filings With No Errors	Sum Errors (all filings)	Average Errors per Filing	Percent Without Error
SAP Disclosure Management	5	5	0	.0	100%
Merrill	406	402	4	.0	99%
Thunderdome (RDG Filings)	293	290	3	.0	99%
Donnelley Financial Solutions	792	783	10	.0	99%
DataTracks	263	260	4	.0	99%
IBM Cognos	43	42	1	.0	98%

The goal is to help these four software vendors/filing agents in particular because they have demonstrated that they are motivated to improve information quality and any other filing agents/software vendors that choose to participate to correct as many inconsistencies as possible related to disclosures so that they can get as close as possible to 100% for the disclosure mechanics and reporting checklist rules that exist in the base set of disclosures.

[23] *Supply Chain Agreeing on Disclosure Business Rules*, http://www.xbrlsite.com/2017/Prototypes/DisclosureAnalysis/SupplyChainAgreeingOnDisclosureBusinessRules.pdf

[24] Quarterly XBRL-based Public Company Financial Report Quality Measurement, http://xbrl.squarespace.com/journal/2017/9/1/quarterly-xbrl-based-public-company-financial-report-quality.html

The 10-K filings of public companies have the most disclosures. Most public company 10-K filings are created between January and March. This campaign to improve quality will begin in December and will continue through the end of March 31, 2018. At that time measurements will be taken.

The current best information for consistency levels of public company 10-K financial reports is shown below for 10-Ks filed by March 31, 2017 by software vendor/filing agent:

September 24, 2017 (10-K for FY 2016)

Generator	Filing Count	Disclosures Consistent	Disclosures Inconsistent	Not Reported	Disclosures Total	Consistent %	Inconsistent %
Ez-XBRL	297	5,202	1,847	11,592	18,641	90%	10%
P3 Data Systems	9	166	66	332	564	88%	12%
GoXBRL	277	3,932	2,053	11,529	17,514	88%	12%
DataTracks	302	5,741	2,270	10,824	18,835	88%	12%
Novaworks Software	599	8,941	4,728	24,083	37,752	87%	13%
Unknown	8	95	65	345	505	87%	13%
Advanced Computer Innovations	211	2,276	1,736	9,382	13,394	87%	13%
S2 Filings	60	1,076	494	2,186	3,756	87%	13%
Compliance Xpressware	44	567	368	1,849	2,784	87%	13%
Fujitsu	4	63	35	156	254	86%	14%
CompSci	70	1,242	624	2,635	4,501	86%	14%
Thunderdome	280	6,132	2,467	8,696	17,295	86%	14%
RR Donnelley	802	19,113	7,182	22,878	49,173	85%	15%
SmartXBRL	8	63	75	373	511	85%	15%
EDGARfilings PROfile	117	2,772	1,078	3,357	7,207	85%	15%
Merrill	414	9,553	3,827	12,077	25,457	85%	15%
Certent (was Rivet)	175	4,122	1,641	4,964	10,727	85%	15%
NeoClarus	35	284	360	1,584	2,228	84%	16%
QXi	100	1,400	1,071	3,818	6,289	83%	17%
Workiva (WebFilings)	2,131	53,065	22,344	54,282	129,691	83%	17%
Vistalytics	21	169	235	925	1,329	82%	18%
IBM Cognos	51	1,262	620	1,203	3,085	80%	20%
Zenhancer	1	13	13	37	63	79%	21%
SAP Disclosure Management	6	154	86	125	365	76%	24%
Oracle	1	30	16	15	61	74%	26%
	6,023	**127,433**	**55,301**	**189,247**	**371,981**	**85%**	**15%**

The following is the same information as above except summarized by disclosure:

September 24, 2017 (10-K for FY 2016)					
DisclosureName	Consistent	Inconsistent	NotReported	PercentConsistent	PercentInconsistent
disclosures:StatementOfIncomeAndComprehensiveIncome	29	65	5,929	99%	1%
disclosures:CapitalLeasesFutureMinimumPaymentsReceivableRollUp	16	78	5,929	99%	1%
disclosures:SignificantAccountingPolicies	5,939	84	0	99%	1%
disclosures:InterestAndOtherIncomeRollUp	8	85	5,930	99%	1%
disclosures:DocumentInformation	5,933	90	0	99%	1%
disclosures:EntityInformation	5,932	91	0	98%	2%
disclosures:LiabilitiesAndEquityRollUp	5,887	119	17	98%	2%
disclosures:LongTermDebtMaturities2	258	172	5,593	97%	3%
disclosures:AssetsRollUp	5,835	175	13	97%	3%
disclosures:OtherAssetsNoncurrent	286	192	5,545	97%	3%
disclosures:UnrecognizedTaxBenefitsExcludingAmountsPertainingToExaminedTaxReturnsRollForward	2,263	244	3,516	96%	4%
disclosures:OtherLiabilitiesNoncurrentHierarchy	189	263	5,571	96%	4%
disclosures:BasisOfReporting	5,737	286	0	95%	5%
disclosures:BalanceSheet	5,735	288	0	95%	5%
disclosures:ProductWarrantyLiability	464	295	5,264	95%	5%
disclosures:FairValueAssetsMeasuredonRecurringBasisUnobservableInputReconciliationCalculationRollForward	413	303	5,307	95%	5%
disclosures:AssetRetirementObligationRollForwardAnalysisRollForward	257	333	5,433	94%	6%
disclosures:OtherNonoperatingIncomeExpense	1,533	342	4,148	94%	6%
disclosures:AccountsPayableAndAccruedLiabilitiesRollUp	326	382	5,315	94%	6%
disclosures:StatementOfChangesInEquity	5,607	416	0	93%	7%
disclosures:IncomeStatement	5,554	420	49	93%	7%
disclosures:FiniteLivedIntangibleAssetsFutureAmortizationExpenseCurrentAndFiveSucceedingFiscalYearsHierarchy	392	457	5,174	92%	8%
disclosures:NetBenefitCosts	951	478	4,594	92%	8%
disclosures:ExpectedBenefitPayments	939	493	4,591	92%	8%
disclosures:RestructuringReserveByTypeOfCost	358	529	5,136	91%	9%
disclosures:AccruedLiabilities	966	588	4,469	90%	10%
disclosures:CapitalLeasesFutureMinimumPaymentsPresentValueOfNetMinimumPaymentsRollUp	416	590	5,017	90%	10%
disclosures:RestructuringChargesRollUp	69	602	5,352	90%	10%
disclosures:AssumptionsUsed	917	602	4,504	90%	10%
disclosures:FiniteLivedIntangibleAssetsFutureAmortizationExpenseRollUp	1,602	616	3,805	90%	10%
disclosures:StockholdersEquityNoteWarrantsOrRights	279	700	5,044	88%	12%
disclosures:AllowanceForCreditLossesonFinancingReceivables	331	724	4,968	88%	12%
disclosures:GeographicAreasLongLivedAssetsInIndividualForeignCountriesByCountryDisclosure	213	776	5,034	87%	13%
disclosures:AllocationOfPlanAssets	615	798	4,610	87%	13%
disclosures:CashFlowStatement	5,105	918	0	85%	15%
disclosures:AccountsNotesLoansAndFinancingReceivable	481	984	4,558	84%	16%
disclosures:SharebasedCompensationRestrictedStockUnitsAwardActivityWeightedAveragePrice	9	986	5,028	84%	16%
disclosures:IndefinitelivedIntangibleAssets	4	1,038	4,981	83%	17%
disclosures:SharebasedPaymentAwardStockOptionsValuationAssumptions	2,540	1,054	2,429	83%	17%
disclosures:DefinedBenefitPlanBenefitObligationRollForward	262	1,141	4,620	81%	19%
disclosures:DeferredTaxAssetsAndLiabilities	4,139	1,142	742	81%	19%
disclosures:NatureOfOperations	4,865	1,158	0	81%	19%
disclosures:OperatingLeasesFutureMinimumPaymentsDueRollUp	2,995	1,158	1,870	81%	19%
disclosures:SharebasedCompensationArrangementsBySharebasedPaymentAward	2,305	1,190	2,528	80%	20%
disclosures:DefinedBenefitPlanFairValueOfPlanAssetsRollForward	218	1,194	4,611	80%	20%
disclosures:LongTermDebtMaturities	1,606	1,218	3,199	80%	20%
disclosures:InventoryNetRollUp	1,477	1,226	3,320	80%	20%
disclosures:PropertyPlantAndEquipmentNetByTypeRollUp	3,806	1,262	955	79%	21%
disclosures:RevenuefromExternalCustomersAttributedToForeignCountriesByGeographicArea	574	1,266	4,183	79%	21%
disclosures:RevenueRecognitionPolicy	4,681	1,342	0	78%	22%
disclosures:EffectiveIncomeTaxRateContinuingOperationsTaxRateReconciliationRollUp	4,032	1,451	540	76%	24%
disclosures:PropertyPlantAndEquipmentUsefulLives	3,699	1,578	746	74%	26%
disclosures:IncomeTaxContingency	810	1,617	3,596	73%	27%
disclosures:GoodwillRollForward	1,543	1,624	2,856	73%	27%
disclosures:IncomeTaxExpenseBenefitDetails	3,593	1,696	734	72%	28%
disclosures:IncomebeforeIncomeTaxDomesticAndForeign	3,406	1,874	743	69%	31%
disclosures:FiniteLivedIntangibleAssetsNetRollUp	1,271	1,925	2,827	68%	32%
disclosures:LongTermDebtInstruments	1,722	2,030	2,271	66%	34%
disclosures:FiniteLivedIntangibleAssetsEstimatedUsefulLives	1,304	2,081	2,638	65%	35%
disclosures:StatementOfComprehensiveIncome	3,682	2,296	45	62%	38%
disclosures:AccumulatedOtherComprehensiveIncomeLoss	792	2,968	2,263	51%	49%
disclosures:OperatingLeasesFutureMinimumPaymentsReceivableRollUp	263	3,208	2,552	47%	53%
	127,433	55,301	190,692	85%	15%

By identifying and correcting errors, we will all learn about how to create high-quality XBRL-based financial reports, perfect the systems of using automated processes for helping in this endeavor, and otherwise learn about XBRL-based digital financial reporting. Software products are likely going to be perfected and otherwise improved, processes are likely going to be perfected and improved, etc.

1.10. Tasks to Be Undertaken

The ***first task*** is to discover any ERRORS where tests are reporting inconsistencies which are actually not inconsistencies. This improves tests. This process will take place between October and December 2017.

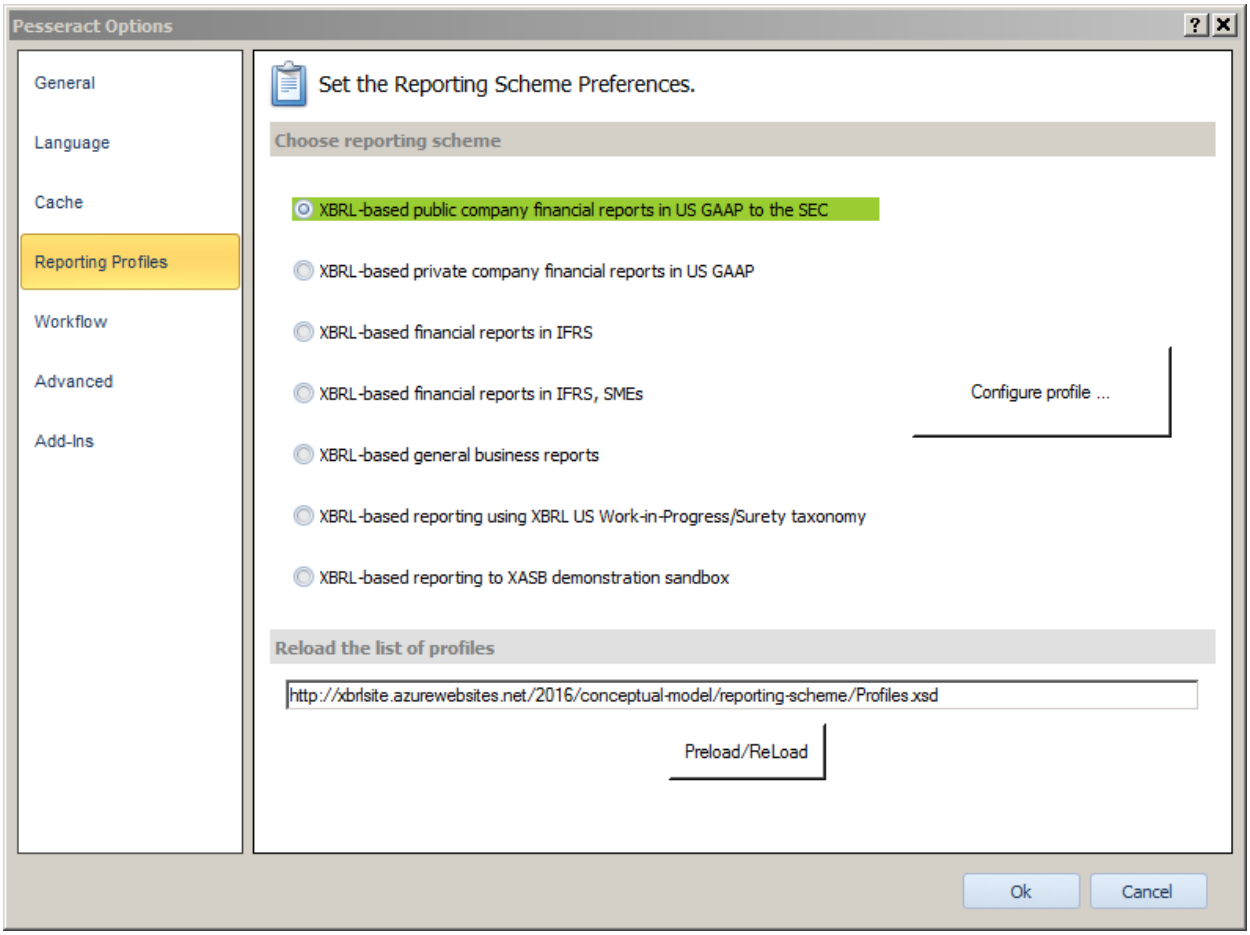
The ***second task*** is to find and correct ERRORS made by creators of reports.

The ***third task*** is to discover any cases were an ERROR is not being reported when, in fact, an error exists and should be reported so that the error can be fixed.

The ***fourth task*** is to add additional business rules for disclosures which currently do not have business rules for discovering inconsistencies.

1.11. US GAAP, IFRS, and General Business Reporting

The software tools and processes created by XBRL Cloud and Pesseract are not unique to US GAAP financial reporting by public companies to the SEC. The software, business rules, conceptual model uses the notion of application profiles and works for US GAAP reporting to the SEC, IFRS reporting in general, IFRS reporting to ESMA (coming soon), IFRS for SMEs, and general business reporting.



1.12. Understanding the Disclosure Mechanics and Reporting Checklist Business Rules

The business rules used for this campaign[25] to improve quality are freely available for anyone to use. Updates and corrections will likewise be free. All the business rules for both the fundamental accounting concept relations and the disclosure mechanics and reporting checklist are 100% conformant to the XBRL global standard. Software vendors and filing agents can leverage XBRL's extensibility features to add new rules and adjust current rules. More information will be provided to those who wish to take advantage of this feature.

1.13. Fundamental Additional Training Every Professional Accountant Needs

Digital financial reporting is the future of financial reporting[26]. Professional accountants need to learn to think digitally. The training professional accountants get in college and early in their career needs to be supplemented slightly to help them understand how to do accounting and auditing in the digital age. This training is not technical.

As best as I can determine, the following is a summary of the additional training that is necessary. The following material is the best draft that I currently have. This information will be better synthesized, organized, and articulated in future versions; however, these are the best versions that I am currently aware of:

- **Accounting and Auditing in the Digital Age**: About 14 pages which provides additional details related to the big picture of how accounting and auditing will change over the next 10 years and why.
- **Conceptual Overview of an XBRL-based, Structured, Digital Financial Report**: About a 25 page conceptual overview of what an XBRL-based digital financial report is.
- **Digital Financial Reporting General Principles**: About 6 pages that synthesize important principles and provides a framework for thinking about XBRL-based digital financial reports and how to make them work correctly.
- **Introduction to Knowledge Engineering for Professional Accountants**: A 49 page introduction to important basic ideas related to representing knowledge in machine-readable form.
- **Comprehensive Introduction to Business Rules**: A 28 page introduction to the important role business rules play in making XBRL-based digital financial reports work correctly.
- **Comprehensive Introduction to Problem Solving Logic**: A 28 page introduction to the important notion of problem solving logic.
- **Comprehensive Introduction to Expert Systems**: A 17 page introduction to expert systems or knowledge based systems; what they are, how they work, what their capabilities are, etc.

[25] These are the rules, http://xbrlsite.azurewebsites.net/2016/conceptual-model/reporting-scheme/us-gaap/reporting-checklist/Disclosures_BASE2_Plus_ReportingChecklist.xsd

[26] IASB Chairman: The times, they are a-changin', http://xbrl.squarespace.com/journal/2017/9/23/iasb-chairman-the-times-they-are-a-changin.html

- **Comprehensive Introduction to Intelligent Software Agents**: A 20 page introduction to intelligent software agents which use business rules and problem solving logic to perform work for professional accountants.

In the approximately 187 pages above, you will get a solid grounding in the information that you need to think about XBRL-based structured digital financial reporting correctly. Remember, this is a paradigm shift, not an incremental change. I can probably reduce the page count by 20%, about 20 pages, due to redundancy.