Managing and Controlling Variability in XBRL-based Financial Reports

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Preventing "Wild Behavior"

- What prevents "wild behavior" of accountants creating XBRL-based financial reports?

- What, specifically, "wild behaviors" need to be prevented?

- What is the role of an XBRL taxonomy in preventing "wild behaviors" of those creating XBRL-based financial reports?

- There are thousands and thousands of small details that work together to constitute what amounts to the logical system that is a financial report.

- The more of those details that can be managed using automated machine-based processes the fewer of those details that need to be monitored by humans.

- Humans make mistakes. Machines don't make mistakes, that is why they are referred to as "machines".

Forms.

- **Forms are easy to control**
- Why?
  - No flexibility.
  - No variability.
- Put numbers into cells.
- Have a formula that checks the math.
- Imagine filling in the information on the right if nothing ever changed.

(BSC)

Network	1001 - Statement - Balance Sheet (http://xasb.org/gaap/role/statement/level4/BalanceSheetClassified)	
Table	Balance Sheet Classified [Table]	
Reporting Entity [Aspect]	http://regulator.gov/id#1234567890	
Legal Entity [Aspect]	Consolidated Entity [Member]	

	Period [Aspect]	
Line Items [Aspect]	2020-12-31	2019-12-31
Assets [Roll Up]		
Current Assets [Roll Up]		
Cash and Cash Equivalents	118,986,000	86,365,000
Receivables	19,792,000	18,277,000
Inventories	4,897,000	5,892,000
Current Assets, Total	143,675,000	110,534,000
Noncurrent Assets [Roll Up]		
Property, Plant and Equipment	23,734,000	18,356,000
Other Noncurrent Assets	6,250,000	3,416,000
Noncurrent Assets, Total	29,984,000	21,772,000
Assets, Total	173,659,000	132,306,000
Liabilities and Equity [Roll Up]		
Liabilities [Roll Up]		
Current Liabilities [Roll Up]		
Accounts Payable and Accrued Expenses	7,390,000	6,898,000
Current Portion of Long-term Debt	1,049,000	751,000
Current Liabilities, Total	8,439,000	7,649,000
Noncurrent Liabilities [Roll Up]		
Long-term Debt	76,073,000	40,557,000
Other Noncurrent Liabilities	17,184,000	13,640,000
Noncurrent Liabilities, Total	93,257,000	54,197,000
Liabilities, Total	101,696,000	61,846,000
Equity [Roll Up]		
Common Stock	69,315,000	68,178,000
Retained Earnings (Accumulated Deficit)	2,648,000	2,282,000
Equity, Total	71,963,000	70,460,000
Liabilities and Equity, Total	173,659,000	132,306,000

Financial Statements are Not Forms.

- **Classified balance sheet (BSC)**
- Properties:
  - Two [Roll Up]s; "Assets" and "Liabilities and Equity".
  - Two roll ups MUST always agree per the accounting equation, i.e. "Assets = Liabilities and Equity"
  - Concept "gaap:Assets" will ALWAYS be the total of the "Assets [Roll Up]"
  - Concept "gaap:LiabilitiesAndEquity" will always be the total of the "Liabilities and Equity [Roll Up]"
  - How do you prevent a current asset from being used to represent a noncurrent asset?

(BSC)

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Reporting Entity [Aspect]	http://regulator.gov/id#1234567890
Legal Entity [Aspect]	Consolidated Entity [Member]

Line Items [Aspect]	Period [Aspect]	
	2020-12-31	2019-12-31
Assets [Roll Up]		
Current Assets [Roll Up]		
Cash and Cash Equivalents	118,986,000	86,365,000
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Equity, Total	71,963,000	70,460,000
Liabilities and Equity, Total	173,659,000	132,306,000

But What if Financial Statements had Patterns?

- **Unclassified balance sheet (BSU)**

- Properties:
  - Two [Roll Up]s; "Assets" and "Liabilities and Equity".
  - Two roll ups MUST always agree per the accounting equation, i.e. "Assets = Liabilities and Equity"
  - Concept "gaap:Assets" will ALWAYS be the total of the "Assets [Roll Up]"
  - Concept "gaap:LiabilitiesAndEquity" will always be the total of the "Liabilities and Equity [Roll Up]"
  - Does NOT contain current assets or liabilities

(BSN)

Network	1001 - Statement - Balance Sheet (http://xasb.org/gaap/role/statement/level4/BalanceSheetUnclassified)	
Table	Balance Sheet Unclassified [Table]	
Reporting Entity [Aspect]	http://regulator.gov/id#1234567890	
Legal Entity [Aspect]	Consolidated Entity [Member]	

Line Items [Aspect]	Period [Aspect]	
	2020-12-31	2019-12-31
Assets [Roll Up]		
Cash and Cash Equivalents	118,986,000	86,365,000
Receivables	19,792,000	18,277,000
Inventories	4,897,000	5,892,000
Property, Plant and Equipment	23,734,000	18,356,000
Other Assets	6,250,000	3,416,000
Assets, Total	173,659,000	132,306,000
Liabilities and Equity [Roll Up]		
Liabilities [Roll Up]		
Accounts Payable and Accrued Expenses	7,390,000	6,898,000
Long-term Debt	77,122,000	41,308,000
Other Liabilities	17,184,000	13,640,000
Liabilities, Total	101,696,000	61,846,000
Equity [Roll Up]		
Common Stock	69,315,000	68,178,000
Retained Earnings (Accumulated Deficit)	2,648,000	2,282,000
Equity, Total	71,963,000	70,460,000
Liabilities and Equity, Total	173,659,000	132,306,000

What if you could describe the model of each balance sheet?

- **Liquidation basis balance sheet (BSL)**

- Properties:
  - ONE roll up, "Net Assets [Roll Up]".
  - Concept "gaap:NetAssets" will ALWAYS be the total of the roll up.

- Each disclosure is uniquely described.

(BSL)

Network	1001 - Statement - Balance Sheet (http://xasb.org/gaap/role/statement/level4/LiquidationBasisBalanceSheet)	
Table	Balance Sheet Liquidation Basis [Table]	
Reporting Entity [Aspect]	http://regulator.gov/id#1234567890	
Legal Entity [Aspect]	Consolidated Entity [Member]	

	Period [Aspect]	
Line Items [Aspect]	2020-12-31	2019-12-31
Assets [Roll Up]		
Current Assets [Roll Up]		
Cash and Cash Equivalents	118,986,000	86,365,000
Receivables	19,792,000	18,277,000
Inventories	4,897,000	5,892,000
Current Assets, Total	143,675,000	110,534,000
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Liabilities [Roll Up]		
Current Liabilities [Roll Up]		
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Noncurrent Liabilities [Roll Up]		
Long-term Debt	76,073,000	40,557,000
Other Noncurrent Liabilities	17,184,000	13,640,000
Noncurrent Liabilities, Total	93,257,000	54,197,000
Liabilities, Total	101,696,000	61,846,000
Net Assets	71,963,000	70,460,000

Is this the same as the first balance sheet?

- **Classified balance sheet (BS1')**
- Noncurrent assets and liabilities are not explicitly reported.
- What if this economic entity used the concept "gaap:NoncurrentAssets" to report geographic area information in a disclosure and used the value $300,000 for the current period?
- (i.e. the entity should have used the concept "gaap:LongLivedAssets")
- How do you prevent this sort of error? Manually check every detail?

(BSC')

Network	1001 - Statement - Balance Sheet (http://xasb.org/gaap/role/statement/level4/BalanceSheetClassified)	
Table	Balance Sheet Classified [Table]	
Reporting Entity [Aspect]	http://regulator.gov/id#1234567890	
Legal Entity [Aspect]	Consolidated Entity [Member]	
	Period [Aspect]	
Line Items [Aspect]	2020-12-31	2019-12-31
Assets [Roll Up]		
Current Assets [Roll Up]		
Cash and Cash Equivalents	118,986,000	86,365,000
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Liabilities [Roll Up]		
Current Liabilities [Roll Up]		
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Current Portion of Long-term Debt	1,049,000	751,000
Current Liabilities, Total	8,439,000	7,649,000
Long-term Debt	76,073,300	40,557,000
Other Noncurrent Liabilities	17,184,000	13,640,000
Liabilities, Total	101,696,000	61,846,000
Equity [Roll Up]		
Common Stock	69,315,000	68,178,000
Retained Earnings (Accumulated Deficit)	2,648,000	2,282,000
Equity, Total	71,963,000	70,460,000
Liabilities and Equity, Total	173,659,000	132,306,000

Classified Balance Sheet #1 (BSC)

	1001 - Statement - Balance Sheet	
Network	(http://xasb.org/gaap/role/statement/level4/BalanceSheetClassified)	
Table	Balance Sheet Classified [Table]	
Reporting Entity [Aspect]	http://regulator.gov/id#1234567890	
Legal Entity [Aspect]	Consolidated Entity [Member]	

	Period [Aspect]	
Line Items [Aspect]	2020-12-31	2019-12-31
Assets [Roll Up]		
Current Assets [Roll Up]		
Cash and Cash Equivalents	118,986,000	86,365,000
Receivables	19,792,000	18,277,000
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Liabilities [Roll Up]		
Current Liabilities [Roll Up]		
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Liabilities, Total	101,696,000	61,846,000
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Equity, Total	71,963,000	70,460,000
Liabilities and Equity, Total	173,659,000	132,306,000

Classified Balance Sheet #2 (BSC')

	1001 - Statement - Balance Sheet	
Network	(http://xasb.org/gaap/role/statement/level4/BalanceSheetClassified)	
Table	Balance Sheet Classified [Table]	
Reporting Entity [Aspect]	http://regulator.gov/id#1234567890	
Legal Entity [Aspect]	Consolidated Entity [Member]	

	Period [Aspect]	
Line Items [Aspect]	2020-12-31	2019-12-31
Assets [Roll Up]		
Current Assets [Roll Up]		
Cash and Cash Equivalents	118,986,000	86,365,000
Receivables	19,792,000	18,277,000
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Liabilities and Equity [Roll Up]		
Liabilities [Roll Up]		
Current Liabilities [Roll Up]		
Accounts Payable and Accrued Expenses	7,390,000	6,898,000
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Long-term Debt	76,073,000	40,557,000
Other Noncurrent Liabilities	17,184,000	13,640,000
Liabilities, Total	101,696,000	61,846,000
Equity [Roll Up]		
Common Stock	69,315,000	68,178,000
Retained Earnings (Accumulated Deficit)	2,648,000	2,282,000
Equity, Total	71,963,000	70,460,000
Liabilities and Equity, Total	173,659,000	132,306,000

Are these two balance sheets logically equivalent?

(BSC)

Network	1001 - Statement - Balance Sheet (http://xasb.org/gaap/role/statement/level4/BalanceSheetClassified)	
Table	Balance Sheet Classified [Table]	
Reporting Entity [Aspect]	http://regulator.gov/id#1234567890	
Legal Entity [Aspect]	Consolidated Entity [Member]	
	Period [Aspect]	
Line Items [Aspect]	2020-12-31	2019-12-31
Assets [Roll Up]		
Current Assets [Roll Up]		
Cash and Cash Equivalents	118,986,000	86,365,000
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Equity, Total	71,963,000	70,460,000
Liabilities and Equity, Total	173,659,000	132,306,000

(BSU)

Network	1001 - Statement - Balance Sheet (http://xasb.org/gaap/role/statement/level4/BalanceSheetUnclassified)	
Table	Balance Sheet Unclassified [Table]	
Reporting Entity [Aspect]	http://regulator.gov/id#1234567890	
Legal Entity [Aspect]	Consolidated Entity [Member]	
	Period [Aspect]	
Line Items [Aspect]	2020-12-31	2019-12-31
Assets [Roll Up]		
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Liabilities [Roll Up]		
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Other Liabilities	17,184,000	13,640,000
Liabilities, Total	101,696,000	61,846,000
Equity [Roll Up]		
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Equity, Total	71,963,000	70,460,000
Liabilities and Equity, Total	173,659,000	132,306,000

(BSL)

Network	1001 - Statement - Balance Sheet (http://xasb.org/gaap/role/statement/level4/LiquidationBasisBalanceSheet)	
Table	Balance Sheet Liquidation Basis [Table]	
Reporting Entity [Aspect]	http://regulator.gov/id#1234567890	
Legal Entity [Aspect]	Consolidated Entity [Member]	
	Period [Aspect]	
Line Items [Aspect]	2020-12-31	2019-12-31
Assets [Roll Up]		
Current Assets [Roll Up]		
Cash and Cash Equivalents	118,986,000	86,365,000
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Noncurrent Liabilities, Total	93,257,000	54,197,000
Liabilities, Total	101,696,000	61,846,000
Net Assets	71,963,000	70,460,000

(BSC')

Network	1001 - Statement - Balance Sheet (http://xasb.org/gaap/role/statement/level4/BalanceSheetClassified)	
Table	Balance Sheet Classified [Table]	
Reporting Entity [Aspect]	http://regulator.gov/id#1234567890	
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	Period [Aspect]	
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Current Assets [Roll Up]		
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What if you identified the patterns for EVERY permissible form of balance sheet?

Another name for these PATTERNS is MODELS.

SUMMARY OF BALANCE SHEET STYLES

Code	Count of Reports Using this Style	Percent of Reports Using this Style	Percent of Reports Consistent with Style
BSC	4,637	81%	98%
BSU	883	15%	99%
BSN	111	2%	99%
BSR	15	1%	99%
BSL	?	?%	?%
BSB	3	0%	100%
Unknown/Other	88	1%	??%
Total	5,734	100%	

99% of reports (5,642) used exactly one of four different balance sheet report styles

I did exactly that for US GAAP and IFRS balance sheets submitted to the SEC. (i.e. analyzed 100% of financial reports using automated processes, 5,734 reports)

SUMMARY OF BALANCE SHEET STYLES

Code	Count of Reports Using this Style	Percent of Reports Using this Style	Percent of Reports Consistent with Style
BSC	4,637	81%	98%
BSU	883	15%	99%
BSN	111	2%	99%
BSR	15	1%	99%
BSL	?	?%	?%
BSB	3	0%	100%
Unknown/Other	88	1%	??%
Total	5,734	100%	

SUMMARY OF INCOME STATEMENT STYLES

Code	Count of Reports Using this Style	Percent of Reports Using this Style	Percent of Reports Consistent with Style
SPEC6	2,080	36%	95%
SPEC1	966	17%	95%
SPEC2	945	17%	95%
INTBX	471	8%	97%
IS6	131	2%	95%
IS3	154	2%	95%
INSBX	118	2%	95%
IS4	82	1%	95%
SPEC8	43	1%	95%
Other known	457	8%	95%
Unknown/Other	287	5%	??%
Total	5,734	100%	

SUMMARY OF CASH FLOW STATEMENT STYLES

Code	Count of Reports Using this Style	Percent of Reports Using this Style	Percent of Reports Consistent with Style
CF1	5,513	96%	99%
CF2	132	2%	99%
Unknown	89	2%	??%
Total	5,734	100%	

SUMMARY OF STATEMENT OF COMPREHENSIVE INCOME STYLES

Code	Count of Reports Using this Style	Percent of Reports Using this Style	Percent of Reports Consistent with Style
SCI1	5,461	95%	99%
SCI2	171	3%	99%
SCI3	13	1%	??%
Unknown/Other	89	1%	??%
Total	5,734	100%	

What if you did this for every statement?

US GAAP: http://www.xbrlsite.com/2018/10K/US-GAAP-Reporting-Styles.pdf

IFRS: http://www.xbrlsite.com/2018/IFRS/IFRS-Reporting-Styles.pdf

HOMELAND ENERGY SOLUTIONS LLC (Filer) CIK: 0001366744

Print Document View Excel Document

Cover
Dcoument and Entity Information Document
Financial Statements
Balance Sheets
Balance Sheets Parenthetical
Statements of Operations

Inventory (Details) (USD $)	Dec. 31, 2013	Dec. 31, 2012
Inventory [Abstract]		
Raw Materials	$ 4,617,404	$ 4,634,704
Work in Process	1,600,041	2,350,304
Finished Goods	1,180,288	2,670,724
Inventory	$ 7,397,733	$ 9,655,732

us-gaap:InventoryNet

X

- Definition
Amount after valuation and LIFO reserves of inventory expected to be sold, or consumed within one year or operating cycle, if longer.

+ References
- Details
Name: us-gaap_InventoryNet
Namespace Prefix: us-gaap_
Data Type: xbrli:monetaryItemType
Balance Type: debit
Period Type: instant

How about if you did it for a disclosure?

DisclosureFound	DisclosureConsistent	RepresentationConcept_TextBlock	RepresentationConcept_Detail	Count	Percent	
FALSE	CONSISTENT	NOT-FOUND	NOT-FOUND	3,612	56%	①
TRUE	CONSISTENT	us-gaap:ScheduleOfInventoryCurrentTableTextBlock	us-gaap:InventoryNet	1,721	27%	②
TRUE	INCONSISTENT	NOT-FOUND	us-gaap:InventoryNet	1,061	16%	③
TRUE	INCONSISTENT	us-gaap:ScheduleOfInventoryCurrentTableTextBlock	NOT-FOUND	46	1%	④
TRUE	CONSISTENT	us-gaap:ScheduleOfUtilityInventoryTextBlock	us-gaap:InventoryNet	19	0%	⑤
TRUE	INCONSISTENT	us-gaap:ScheduleOfUtilityInventoryTextBlock	NOT-FOUND	7	0%	⑥
				6,466	100%	⑦
			Consistent with expectation	5,352	83%	
			Inconsistent with expectation	1,114	17%	
			Total	6,466	100%	

- **Line #1** indicates that NEITHER the Level 3 Disclosure Text Block nor the Level 4 Disclosure Details were found, meaning this disclosure is not present and is consistent with expectations should the disclosure not exist in the report. Basically, 56% of public companies do not report inventory.
- **Line #2** indicates that BOTH the Level 3 Disclosure Text Block AND the Level 4 Disclosure Detail line items WERE found. This is as expected. A total of 27% of public companies report using these concepts.
- **Line #3, Line #4, and Line #7** indicates an inconsistency because either the Level 3 Disclosure Text Block was found OR the Level 4 Disclosure Detail was found but NOT BOTH.
- **Line #5** indicates that 19 companies used an ALTERNATIVE Level 3 Disclosure Text Block to report the inventory components roll up, but the same Level 4 Disclosure Detail concept.

- **Line #7** indicates the total population of public company financial reports analyzed, which is 6,466 10-K filings as of March 31, 2016.

You identified the patterns for the disclosure.

And then you repeated this for every disclosure?

(I only did this for 65 very common US GAAP disclosures)

		March 31, 2019 (10-K for FY 2018)					
#	DisclosureName	Found and Consistent	Found and Inconsistent	Not Found	Total Filings	% Consistent	% Inconsistent
1	disclosures:EntityInformation	5,542	13	0	5,555	100%	0%
2	disclosures:DocumentInformation	5,541	14	0	5,555	100%	0%
3	disclosures:RestructuringReserveRollForward	90	65	5,400	5,555	99%	1%
4	disclosures:LiabilitiesAndEquityRollUp	5,466	69	20	5,555	99%	1%
5	disclosures:LongTermDebtInstrumentsRollUp	127	73	5,355	5,555	99%	1%
6	disclosures:InterestAndOtherIncomeRollUp	7	74	5,474	5,555	99%	1%
7	disclosures:CapitalLeasesFutureMinimumPaymentsReceivableRollUp	14	78	5,463	5,555	99%	1%
8	disclosures:SignificantAccountingPolicies	5,477	78	0	5,555	99%	1%
9	disclosures:ProductWarrantyLiability	466	83	5,006	5,555	99%	1%
10	disclosures:AssetsRollUp	5,428	119	8	5,555	98%	2%
11	disclosures:RestructuringAndRelatedCostHierarchy	116	127	5,312	5,555	98%	2%
12	disclosures:AcquiredFiniteLivedIntangibleAssetByMajorClass	521	160	4,874	5,555	97%	3%
13	disclosures:FutureMinimumRentalPaymentsForOperatingLeases	495	176	4,884	5,555	97%	3%
14	disclosures:BalanceSheet	5,374	181	0	5,555	97%	3%
15	disclosures:Goodwill	181	189	5,185	5,555	97%	3%
16	disclosures:UnrecognizedTaxBenefitsExcludingAmountsPertainingToExaminedTaxReturnsRollForward	2,159	203	3,193	5,555	96%	4%
17	disclosures:BasisOfReporting	5,334	221	0	5,555	96%	4%
18	disclosures:FiniteLivedIntangibleAssetsFutureAmortizationExpenseRollUp	1,188	226	4,141	5,555	96%	4%
19	disclosures:OtherNonoperatingIncomeExpense	2,018	229	3,308	5,555	96%	4%
20	disclosures:IncomeStatement	5,208	239	108	5,555	96%	4%
21	disclosures:RestructuringChargesRollUp	405	257	4,893	5,555	95%	5%
22	disclosures:StatementOfComprehensiveIncome	2,724	258	2,573	5,555	95%	5%
23	disclosures:OtherAssetsNoncurrent	281	260	5,014	5,555	95%	5%
24	disclosures:ExpectedBenefitPayments	1,085	270	4,200	5,555	95%	5%
25	disclosures:AssetRetirementObligationRollForwardAnalysisRollForward	224	291	5,040	5,555	95%	5%
26	disclosures:LongTermDebtMaturities2	558	294	4,703	5,555	95%	5%
27	disclosures:OtherLiabilitiesNoncurrentHierarchy	218	305	5,032	5,555	95%	5%
28	disclosures:StatementOfChangesInEquity	5,246	309	0	5,555	94%	6%
29	disclosures:RestructuringReserveByTypeOfCost	324	337	4,894	5,555	94%	6%
30	disclosures:NetBenefitCosts	981	385	4,189	5,555	93%	7%
31	disclosures:AccountsPayableAndAccruedLiabilitiesRollUp	331	391	4,833	5,555	93%	7%
32	disclosures:FiniteLivedIntangibleAssetsFutureAmortizationExpenseCurrentAndFiveSucceedingFiscalYearsHierarchy	985	429	4,141	5,555	92%	8%
33	disclosures:SharebasedCompensationRestrictedStockUnitsAwardActivityWeightedAveragePrice	3,963	458	1,134	5,555	92%	8%
34	disclosures:FairValueAssetsMeasuredonRecurringBasisUnobservableInputReconciliationCalculationRollForward	827	459	4,269	5,555	92%	8%
35	disclosures:GeographicAreasLongLivedAssetsInIndividualForeignCountriesByCountryDisclosure	1,003	507	4,045	5,555	91%	9%
36	disclosures:IncomebeforeIncomeTaxDomesticAndForeign	1,448	526	3,581	5,555	91%	9%
37	disclosures:AssumptionsUsed	950	530	4,075	5,555	90%	10%
38	disclosures:CapitalLeasesFutureMinimumPaymentsPresentValueOfNetMinimumPaymentsRollUp	423	551	4,581	5,555	90%	10%
39	disclosures:OperatingLeasesFutureMinimumPaymentsDueRollUp	2,994	574	1,987	5,555	90%	10%
40	disclosures:AccruedLiabilities	988	578	3,989	5,555	90%	10%
41	disclosures:StockholdersEquityNoteWarrantsOrRights	336	626	4,593	5,555	89%	11%
42	disclosures:AccountsNotesLoansAndFinancingReceivable	1,019	680	3,856	5,555	88%	12%
43	disclosures:AllowanceForCreditLossesonFinancingReceivables	332	692	4,531	5,555	88%	12%
44	disclosures:SharebasedPaymentAwardStockOptionsValuationAssumptions	2,554	814	2,187	5,555	85%	15%
45	disclosures:DefinedBenefitPlanBenefitObligationRollForward	478	852	4,225	5,555	85%	15%
46	disclosures:DefinedBenefitPlanFairValueOfPlanAssetsRollForward	436	898	4,221	5,555	84%	16%
47	disclosures:RevenuefromExternalCustomersAttributedToForeignCountriesByGeographicArea	763	957	3,835	5,555	83%	17%
48	disclosures:SharebasedCompensationArrangementsBySharebasedPaymentAward	2,551	958	2,046	5,555	83%	17%
49	disclosures:DeferredTaxAssetsAndLiabilities	4,004	991	560	5,555	82%	18%
50	disclosures:LongTermDebtMaturities	1,329	1,000	3,226	5,555	82%	18%
51	disclosures:IndefinitelivedIntangibleAssets	47	1,001	4,507	5,555	82%	18%
52	disclosures:FiniteLivedIntangibleAssetsNetRollUp	1,477	1,010	3,068	5,555	82%	18%
53	disclosures:NatureOfOperations	4,493	1,062	0	5,555	81%	19%
54	disclosures:PropertyPlantAndEquipmentNetByTypeRollUp	3,694	1,066	795	5,555	81%	19%
55	disclosures:InventoryNetRollUp	1,469	1,092	2,994	5,555	80%	20%
56	disclosures:GoodwillRollForward	1,523	1,126	2,906	5,555	80%	20%
57	disclosures:LongTermDebtInstruments	2,482	1,148	1,925	5,555	79%	21%
58	disclosures:AllocationOfPlanAssets	7	1,328	4,220	5,555	76%	24%
59	disclosures:PropertyPlantAndEquipmentUsefulLives	3,559	1,376	620	5,555	75%	25%
60	disclosures:EffectiveIncomeTaxRateContinuingOperationsTaxRateReconciliationRollUp	3,593	1,614	348	5,555	71%	29%
61	disclosures:IncomeTaxExpenseBenefitDetails	3,316	1,719	520	5,555	69%	31%
62	disclosures:CashFlowStatement	3,708	1,847	0	5,555	67%	33%
63	disclosures:FiniteLivedIntangibleAssetsEstimatedUsefulLives	1,344	1,927	2,284	5,555	65%	35%
64	disclosures:AccumulatedOtherComprehensiveIncomeLoss	1,314	2,306	1,935	5,555	58%	42%
65	disclosures:RevenueRecognitionPolicy	3,183	2,372	0	5,555	57%	43%
		125,721	41,048	194,306	361,075	89%	11%

What if you put that information into machine-readable form and then generated human-readable information from the machine-readable information?

Rules: disclosures:InventoryNetRollUp

Disclosure mechanics validation for disclosure: **disclosures:InventoryNetRollUp**

Roll up of details of components of current inventory, net.

This disclosure:

- **MUST** be represented by the networks with the SEC Category: **DISCLOSURE**
- **MUST** be represented as an **SEC Level 4 Disclosure Detail** with the concept arrangement pattern: **ROLL UP**
    - ROLL UP REQUIRES the total concept `us-gaap:InventoryNet`
        - or alternative concept: `us-gaap:InventoryNetOfAllowancesCustomerAdvancesAndProgressBillings`
        - or alternative concept: `us-gaap:PublicUtilitiesInventory`
        - or alternative concept: `us-gaap:AirlineRelatedInventory`
        - or alternative concept: `us-gaap:RetailRelatedInventory`
        - or alternative concept: `us-gaap:EnergyRelatedInventory`
        - or alternative concept: `us-gaap:AgriculturalRelatedInventory`
- **MUST** be represented using the **SEC Level 3/2 Disclosure Text Block**: `us-gaap:ScheduleOfInventoryCurrentTableTextBlock`
    - or alternative concept: `us-gaap:ScheduleOfUtilityInventoryTextBlock`
- Requires the note to be reported using the **SEC Level 1 Note Text Block**: `us-gaap:InventoryDisclosureTextBlock`
- Requires the policy to be reported using the **SEC Level 2 Policy Text Block**: `us-gaap:InventoryPolicyTextBlock`
    - or alternative concept: `us-gaap:InventoryMajorClassesPolicy`
    - or alternative concept: `us-gaap:InventorySuppliesPolicy`
    - or alternative concept: `us-gaap:InventoryWorkInProcessPolicy`
    - or alternative concept: `us-gaap:InventoryFinishedGoodsPolicy`

Ok

Machine readable XBRL: http://xbrlsite.azurewebsites.net/2016/conceptual-model/reporting-scheme/us-gaap/disclosure-mechanics/517-rules-def.xml

What if you then organized all of this information into a software interface which you could use to interact with the information during the process of creating a financial report?

Human-readable:

What are the patterns?

- Every financial report has identifiable "fragments"; **the report is not one big thing it is a lot of little things**.

- Each fragment has patterns:
  - It is either a "set", a "roll up", a "roll forward", a "text block", etc…
  - It is used to represent some portion of a disclosure.
  - Information represented *within* a fragment has to be consistent with other information in that fragment.
  - Information represented *some other* fragment must not contradict or be otherwise be inconsistent with information in another fragment.

- The **patterns** forms a logical system described using *models* that describe the system, *structures* that describe the models, and *statements* that describe the structures.

Logical Systems: http://xbrl.squarespace.com/journal/2019/9/25/understanding-and-expressing-logical-systems.html

Statements.

- **Statement**: A statement is a proposition, claim, assertion, belief, or fact about or related to the universe of discourse.
  - **Assertion**: An assertion is a type of statement which specifies a permissible manipulation within a structure within a model for a theory.
    - **Axiom**: An axiom is a statement which describes a self-evident logical principle related to a universe of discourse that no one would argue with or otherwise dispute.
    - **Theorem**: A theorem is a statement which makes a logical deduction which can be proven by constructing a chain of reasoning by applying axioms or other theorems in the form of IF...THEN statements.
    - **Restriction**: A restriction is a statement that is a special type of axiom or theorem imposed by some authority which restricts, constrains, limits, or imposes some range.
  - **Term**: A term is a statement that specifies the existence of a primitive (a.k.a. simple, atomic) or functional (a.k.a. complex, composite) idea that is used within a universe of discourse. Terms are generally nouns.
  - **Relation**: A relation (a.k.a. predicate) is a statement that specifies a permissible structure or specifies a property of a term. A relation is generally a verb.
    - **Is-a**: An is-a relation specifies a general-special or wider-narrower or class-subclass or type-of type relation between terms. (class)
    - **Has-a**: A has-a relation specifies a has-part or part-of type relation between terms. (meronymy)
    - **Property-of**: A property-of relation specifies that a term has a specific quality, trait, or attribute. (property)
  - **Fact**: A fact (a.k.a. instance, individual) is a statement that specifies a piece of information about circumstances that exist or events that have occurred that is reported by an entity "as of" or "for a period" of time and otherwise distinguishable from one another by one or more aspects.

Logical Systems: http://xbrl.squarespace.com/journal/2019/9/25/understanding-and-expressing-logical-systems.html

Another Name for Assertion is "Rule".

- The term **assertion** is a synonym for **rule**.

- The Merriam-Webster dictionary defines anarchy as "a situation of confusion and wild behavior in which the people in a country, group, organization, community, etc., are not controlled by rules or laws." Rules prevent information anarchy.

- Rules enable a knowledge bearer to describe information they are providing and verify that the information provided is consistent with that description. Rules enable a knowledge receiver to understand the description of information provided by the knowledge bearer and likewise verify that the information is consistent with that description.

- Rules guide, control, suggest, or influence behavior. Rules cause things to happen, prevent things from happening, or suggest that it might be a good idea if something did or did not happen. Rules help shape judgment, help make decisions, help evaluate, help shape behavior, and help reach conclusions.

- Rules arise from the best practices of knowledgeable business professionals. A rule describes, defines, guides, controls, suggests, influences or otherwise constrains some aspect of knowledge or structure within some problem domain.

- Don't make the mistake of thinking that rules are completely inflexible and that you cannot break rules. Sure, maybe there are some rules that can never be broken. Maybe there are some rules that you can break. It helps to think of breaking rules as penalties in a football game. The point is that the guidance, control, suggestions, and influence offered by rules are a choice of business professionals.

- The meaning of a rule is separate from the level of enforcement someone might apply to the rule.

- A rule states a fact about the world (declarative rule). A rule can provide instructions (production rule).

What, Specifically, Can Go Wrong?

Example of Potential Problem	How to Mitigate Problem
Incorrectly represent relations in a set (structure) of XBRL presentation relations. *For example, a [Member] was inadvertently used within a set of [Line Items] which is illogical.*	Specify what relations are allowed using XBRL definition relations, automate the process of checking XBRL presentation structures. 100% automatable if rules are provided.
Use one class of concept to represent information that relates to some other class. *For example, if the concept "Cost of Revenues" (which is a DIRECT operating expense) is used within a roll up of "Operating Expense" (which is an INDIRECT operating expense).*	Provide "class-subclass" relations within an XBRL taxonomy to specifically and fully specify the classes and their allowed subclasses. Then, use automated machine-based processes to make sure the relations expressed in a company extension are within the set of permissible relations.
A concept is incorrectly used to represent a fact. *For example, the concept "gaap:NoncurrentAssets" is used to represent information which should have used "gaap:LongLivedAssets".*	Provide fundamental accounting concept consistency cross check rules to automate the process of checking key, high-level relations between classes of concepts to identify contradictions and inconsistencies.
Mathematical relations are incorrect. *For example, the facts provided on the balance sheet roll up or within a disclosure roll forward do not foot.*	Provide machine-readable descriptions of 100% of the mathematical relations that exist within a report and use automated processes to check report information to make sure reported information is consistent with expectation.
A required disclosure is not provided in a report. *For example, the nature of operations disclosure or the basis of reporting disclosure are not provided. Or, if the line items "Inventories" is provided on the balance sheet but there is no components of inventories disclosure or inventories policy provided and the inventories amount is material relative to other reported information.*	Provide machine-readable descriptions to the extent possible that indicates what disclosures are always required, what disclosures are required when a specific line item is reported, what disclosures are required if some other disclosure is reported, etc.

Examples of Errors.

Much can be learned by examining errors made in XBRL-based financial reports. Here is one example: *1847 Holdings LLC*

http://www.sec.gov/Archives/edgar/data/1599407/000147793218005687/0001477932-18-005687index.htm

This economic entity used *parent equity concept* to represent *total equity* and *total equity concept* to represent *parent equity*. Also, inappropriately labeled the two different line items with the same label which is incorrect.

High-quality documentation for 26 errors:

http://xbrlsite.azurewebsites.net/2019/Library/FundamentalAccountingConceptRelationsErrorExamples.pdf

High-quality documentation for hundreds of errors:

http://xbrl.squarespace.com/journal/2019/3/29/examples-of-errors-in-xbrl-based-digital-financial-reports.html

Leveraging the Four Statement Model.

By definition, all financial reports fit into the four statement model

Four Statement Model

Understanding how to four financial statements (balance sheet, cash flow statement, changes in equity, and income statement are tied together mathematically and logically.

Cash Flow Statement [Abstract]

Cash Flow Statement [Abstract]	Period [Axis]
	2020-01-01 - 2020-12-31
Cash Flow Statement [Abstract]	
Net Cash Flow [Roll Up]	
Net Cash Flow from Operating Activities	3,500
Net Cash Flow from Investing Activities	0
Net Cash Flow from Financing Activities	0
Net Cash Flow	3,500
Assets [Roll Forward]	
Assets, Beginning	0
Net Cash Flow	3,500
Assets, Ending	3,500

Income Statement [Abstract]

Income Statement [Abstract]	Period [Axis]
	2020-01-01 - 2020-12-31
Income Statement [Abstract]	
Net Income [Roll Up]	
Income from Ordinary Activities of Entity [Roll Up]	
Revenues	7,000
(Expenses)	(3,000)
Income from Ordinary Activities of Entity	4,000
Income from Peripheral or Incidental Transactions of Entity [Roll Up]	
Gains	1,000
(Losses)	(2,000)
Income from Peripheral or Incidental Transactions of Entity	(1,000)
Net Income	3,000

Balance Sheet [Abstract]

Balance Sheet [Abstract]	Period [Axis]	
	2020-12-31	2019-12-31
Balance Sheet [Abstract]		
Assets [Roll Up]		
Current Assets	3,500	0
Noncurrent Assets	0	0
Assets	3,500	0
Liabilities and Equity [Roll Up]		
Liabilities [Roll Up]		
Current Liabilities	0	0
Noncurrent Liabilities	0	0
Liabilities	0	0
Equity [Roll Up]		
Equity Attributable to Controlling Interest	3,500	0
Equity Attributable to Noncontrolling Interest	0	0
Equity	3,500	0
Liabilities and Equity	3,500	0

Changes in Equity [Abstract]

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