Proving Accounting, Structural, Mathematical, and Other Logic of XBRL-based Financial Reports

Understanding specific situations which cause accounting logic, mathematical logic, or other logic errors and how to eliminate those situations and thus the errors

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"I skate to where the puck is going to be, not where it has been." *Wayne Gretzky*, legendary Canadian hockey star

Executive summary:

- XBRL-based financial reports are logical systems[1]. Said another way, such reports are not arbitrary, haphazard, illogical, or random.
- There are nine specific identifiable situations which occur in XBRL-based financial reports which cause accounting logic, mathematical logic, structural logic, or other types of logical errors.
- Each of the nine specific identifiable situations can be eliminated using XBRL-based machine-readable rules and software which understands how to leverage the rules and make report creation software users aware of such logical errors so that the errors can be corrected.
- Those same XBRL-based machine-readable rules can be used by those who desire to extract information from such reports reliably and effectively.
- Today, two software applications exist which leverage these XBRL-based machine-readable rules and show high-quality XBRL-based financial reports can be reliably created.

[1] Charles Hoffman, *Understanding and Expressing Logical Systems*, http://xbrl.squarespace.com/journal/2019/9/25/understanding-and-expressing-logical-systems.html

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There are nine specifically identifiable situations which enable the possibility of accounting logic errors, mathematical errors, or other types of provable logical errors to enter XBRL-based financial reports and remain undetected. The following is a summary of these nine situations and what can be done to eliminate the possibility of these nine categories of errors:

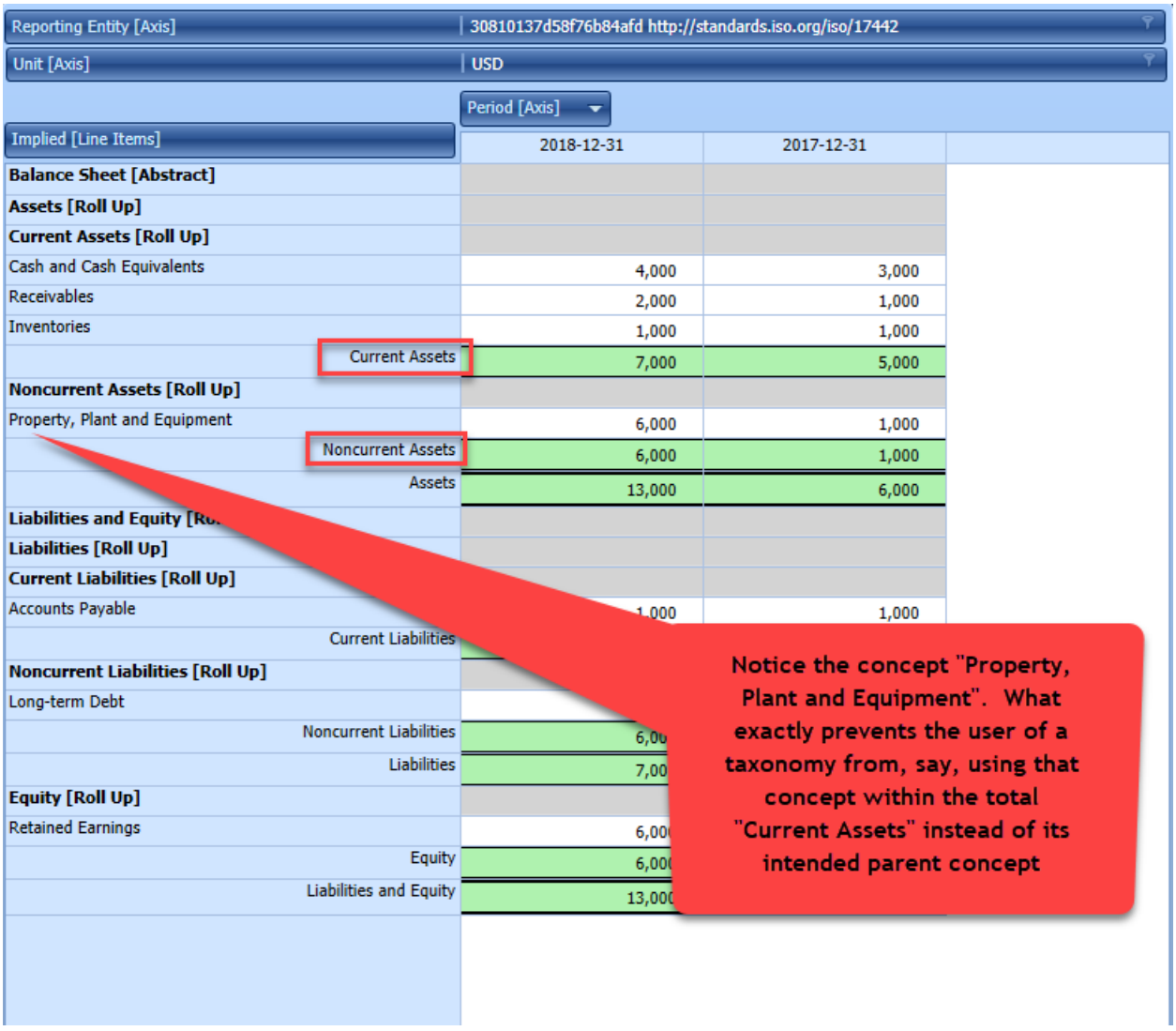
#	Description of situation	Elimination of situation
1	Using an existing base taxonomy concept intended to represent one class of concept inadvertently to represent some other class of concept.	Formal "class-subclass" relations represented in machine-readable form within base XBRL financial reporting taxonomies will eliminate the possibility of this situation.
2	Lack of clarity of the meaning of extension concepts.	Formal "class-subclass" relations articulated in machine-readable form provide clarity of extension concept meaning.
3	Unreported high-level subtotals.	Clearly communicate what concepts might potentially be used to represent high-level financial report line items, provide machine-readable rules to derive unreported high-level financial report line items, and provide machine-readable rules to verify that the high-level financial report line items mathematical relations are intact.
4	Variability allowed for reporting high-level accounting relationships.	In order to successfully overcome the variability allowed in financial reports; each variation of balance sheet, income statement, cash flow statement, and statement of comprehensive income must be explicitly provided for in an XBRL financial reporting base taxonomy. In addition, the rules that define those fundamental high-level accounting relations must be articulated for each variation of each statement.
5	High-level financial report line item inconsistencies and contradictions.	Every variation of primary financial statement must have a set of consistency cross check rule that explain those high-level fundamental accounting concept relations of that specific variation and can then be used to make certain that no continuity errors exist because of inconsistent facts or contradictions in reported facts.
6	Presentation relations model structure relations illogical.	A set of allowed relations between the parents and children of each category of report element should be explicitly and unambiguously articulated to those creating XBRL-based reports.
7	Verification that each report fragment is created correctly.	Provide a set of rules that articulate the key logical aspects of each report fragment that is to be reported. To achieve this, each disclosure must be named in order to organize this information and rules are then associated with each specific named disclosure using XBRL definition relations.
8	Mathematical relations are not explained using machine-readable rules and then verified against that machine-readable explanation.	Each report should provide machine-readable rules that can be used to explain the mathematical relations that exist in a report and to verify that the information in the report is consistent with those explanations.
9	Verification that each report fragment that is required to be disclosure exists within the financial report.	Provide a set of rules that explain when specific disclosures are expected to be provided within a financial report which can be used by software applications to verify consistency of the report to what is expected per the machine-readable explanation.

The following sections provide additional details that elaborate on the above summary.

Situation 1: Using an existing base taxonomy concept intended to represent one class of concept inadvertently to represent some other class of concept.

What prevents someone creating an XBRL-based financial report from using a concept intended to be used to represent one classification to incorrectly use that concept to represent some other classification of concept?

For example, the concept “Property, Plant and Equipment” is intended to be part of “Noncurrent Assets”. What prevents someone creating an XBRL-based financial report from inadvertently use the concept “Property, Plant and Equipment” to represent a “Current Asset”?

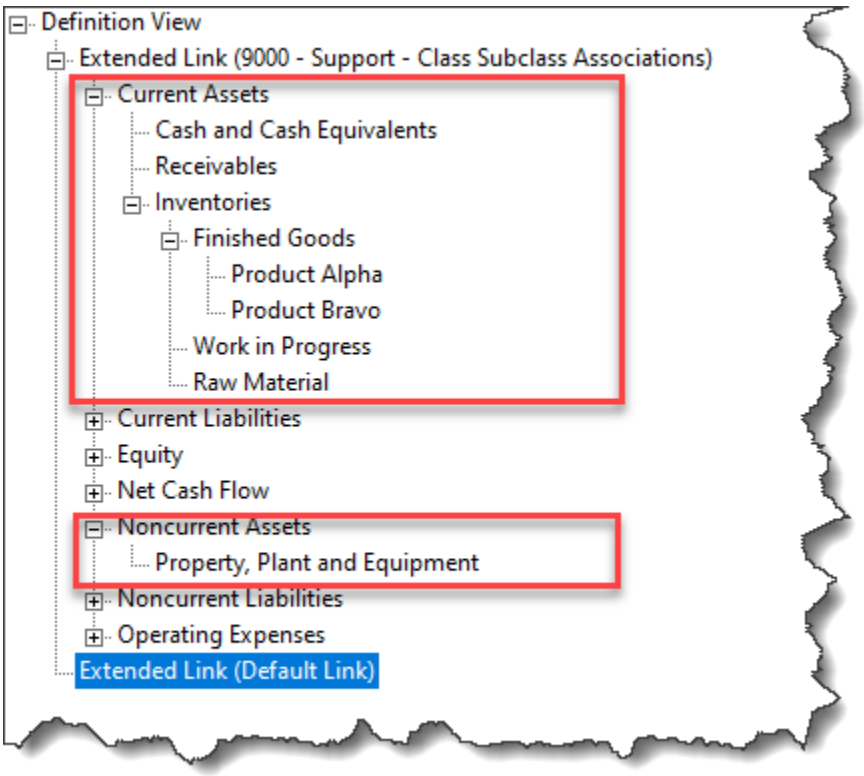


The example provided is an easy to understand example of literally thousands of possible similar situations when an XBRL-based financial report is created. What functionality does the

base taxonomy provide to (a) clearly indicate how the concept should be used and (b) enable automatable processes to check if a concept is being used incorrectly?

The screen shot below is generated from a set of XBRL definition relations[2]. The XBRL definition relations formally document relations or associations between concepts; financial report high-level classifications such as "Current Assets" and formal, explicitly defined subclassifications that are allowed for that subclassification, for example "Cash and Cash Equivalents" and "Receivables".

The relations were expressed in the XBRL definition relations using a proprietary arcrole, "**class-subClass**" which was defined using global standard functionality provided by the XBRL technical syntax[3].



A second software tool shows the actual XBRL arcrole used to express the association within the XBRL definition relations:

[2] XBRL definition relations which define class-subclass relations, http://xbrlsite.azurewebsites.net/2019/Prototype/proof/basic-classes-definition.xml
[3] XBRL taxonomy schema which defines arcrole for "class-subClass", http://xbrlsite.azurewebsites.net/2016/conceptual-model/cm-arcroles.xsd

-	Arcrole	Name	Order
Definition View			
9000 - Support - Class Subclass Associations			
Changes in Retained Earnings		basic:ChangesInRetainedEarnings	0
Current Assets		basic:CurrentAssets	0
Cash and Cash Equivalents	http://xbrlsite.azurewebsites.net/2016/conceptual-model/arcrole/class-subClass	basic:CashAndCashEquivalents	1
Receivables	http://xbrlsite.azurewebsites.net/2016/conceptual-model/arcrole/class-subClass	basic:Receivables	2
Inventories	http://xbrlsite.azurewebsites.net/2016/conceptual-model/arcrole/class-subClass	basic:Inventories	3
Current Liabilities		basic:CurrentLiabilities	0
Equity		basic:Equity	0
Net Cash Flow		basic:NetCashFlow	0
Noncurrent Assets		basic:NoncurrentAssets	0
Property, Plant and Equipment	http://xbrlsite.azurewebsites.net/2016/conceptual-model/arcrole/class-subClass	basic:PropertyPlantAndEquipment	1
Noncurrent Liabilities		basic:NoncurrentLiabilities	0
Operating Expenses		basic:OperatingExpenses	0

While the approach of using what amounts to a proprietary "class-subClass" relation to formally express these sorts of associations works; this approach is not necessarily optimal. XBRL International provides a means to express this sort of association, the "general-special[4]" definition relation. However, the semantics of the "general-special" arcrole are somewhat vague and the semantics are inconsistent with the OWL definition of "class-Subclass".

Another possible alternative is the "wider-narrower[5]" arcrole defined by the ESMA. This formal expression is provided by XBRL International via the Link Role Registry (LRR) which is good. But again, the semantics of the "wider-narrower" arcrole are different than the standard "class-subClass" relation defined by OWL.

All things considered, any of these three alternatives could work. Perhaps a more perfect solution would be for XBRL International to provide an XBRL arcrole that is define to be consistent with the OWL "class-subClass" relation semantics and make that arcrole available via the XBRL Link Role Registry (LRR)[6].

The over-arching objective is to help users of a base taxonomy to understand the correct and incorrect use of concepts and other report elements contained within the XBRL taxonomy. Further, expressing this information formally and explicitly using machine-readable XBRL would enable software applications to detect such errors.

ELIMINATING SITUATION: Formal "class-subclass" relations represented in machine-readable form within base XBRL financial reporting taxonomies will eliminate the possibility of this situation by making these relations clear and enabling the creation of automated software processes for detecting such errors so that they might be corrected.

[4] XBRL technical specification, "general-special" arcrole, http://www.xbrl.org/Specification/XBRL-2.1/REC-2003-12-31/XBRL-2.1-REC-2003-12-31+corrected-errata-2013-02-20.html#_5.2.6.2.1
[5] XBRL International Link Role Registry, "wider-narrower", https://specifications.xbrl.org/registries/lrr-2.0/#arcrole-wider-narrower
[6] XBRL International, Link Role Registry, https://specifications.xbrl.org/registries/lrr-2.0/

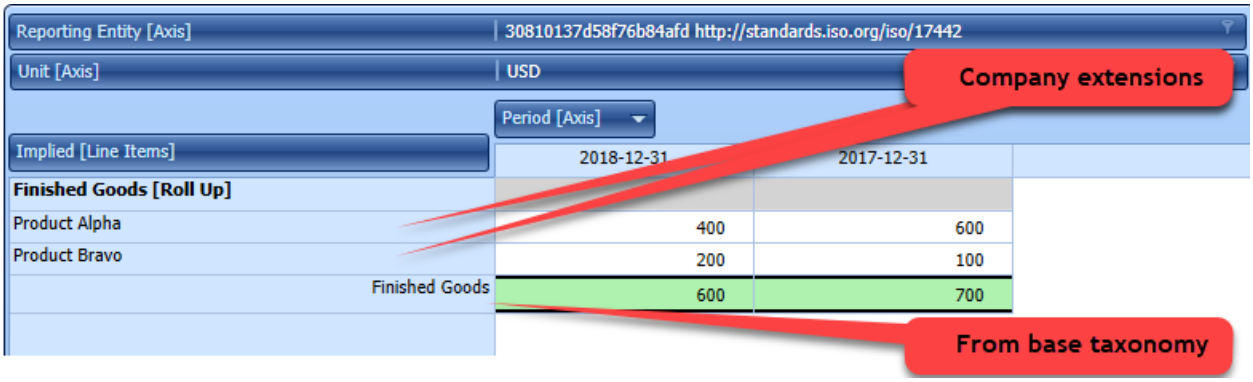
Situation 2: Lack of clarity of the meaning of extension concepts.

Extension concepts tend to all get grouped into the category of "bad" when it comes to XBRL-based financial reports. However, this is a mischaracterization and over-generalization of extension concepts.

Consider the following example. An economic entity properly reports the concept "Inventories" on its balance sheet as is required[7]. Further, the economic entity provides a disclosure of the breakdown of the subclassifications of inventories[8].

But the, suppose that an economic entity wants to provide a further breakdown of the subclassifications or components of finished goods inventories[9]. They do so within a separate disclosure which is not required by an economic entity to make; essentially the economic entity is choosing to provide additional information which they feel might be helpful to understating the economic entity.

And so, two economic entity extension concepts are created, "Product Alpha" and Product Bravo" which then total to the base taxonomy concept "Finished goods".



(Note that in the actual example, all concepts are represented in one taxonomy for simplicity of creating this example. In a real report, the two concepts "Product Alpha" and "Product Bravo" would be from a separate namespace with an economic entity's extension taxonomy, however in the example provided they come from the same namespace.)

[7] Example economic entity balance sheet containing inventories line item, http://xbrlsite.azurewebsites.net/2019/Prototype/proof/evidence-package/contents/index.html#Rendering-BalanceSheet-Implied.html

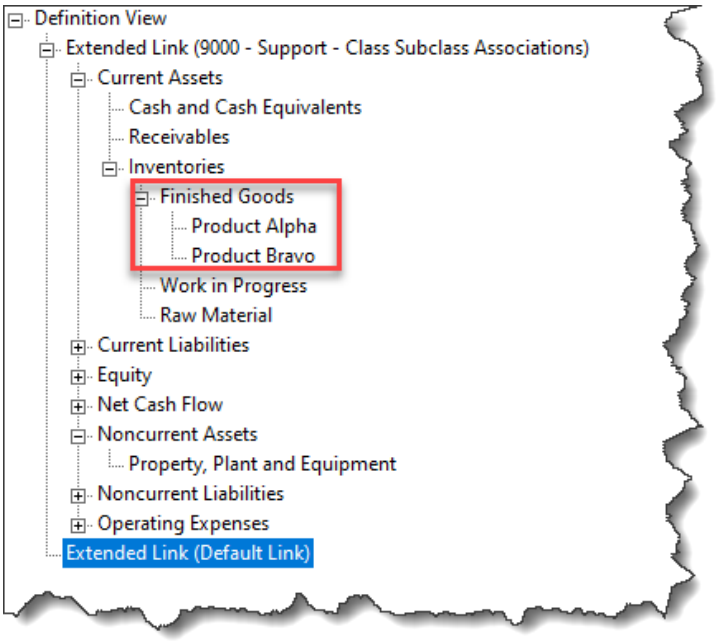
[8] Subclassifications of inventories, http://xbrlsite.azurewebsites.net/2019/Prototype/proof/evidence-package/contents/index.html#Rendering-InventoriesDetail-Implied.html

[9] Subclassifications of finished goods inventory, http://xbrlsite.azurewebsites.net/2019/Prototype/proof/evidence-package/contents/index.html#Rendering-FinishedGoodsDetail-Implied.html

Now, is it possible to understand that "Product Alpha" and "Product Bravo" are subclassifications of "Finished Goods" by only providing the information you see above? The answer is yes. How? The Finished Goods [Roll Up] expresses XBRL calculation relations, "summation-item[10]", which can be interpreted as meaning that the two extension concepts created are part of the base taxonomy "Finished Goods" concept.

However, this approach will only work for concepts that participate in XBRL calculation relations. How would information about other extension concepts be represented if they are not part of a roll up computation of if the concept is nonnumeric?

The same "class-subclass" relations used in the first situation could likewise be used to solve the issue of understanding the nature of extension concepts provided relative to a base taxonomy. XBRL definition relations can be used to show the association between an extension concept created and the base taxonomy using "class-subclass" arcroles to formally and explicitly express the association[11].



So here, the company would hook "Product Alpha" and "Product Bravo" to the tree as children of "Finished Goods" with the relation predicate (XBRL arcrole) "class-subclass". Alternatively,

[10] XBRL technical specification, Calculation Scoping, http://www.xbrl.org/Specification/XBRL-2.1/REC-2003-12-31/XBRL-2.1-REC-2003-12-31+corrected-errata-2013-02-20.html#_5.2.5.2.2

[11] XBRL definition relations which define class-subclass relations hooking extension concept to base taxonomy, http://xbrlsite.azurewebsites.net/2019/Prototype/proof/basic-classes-definition.xml

as previously stated, the existing “general-special” or “wider-narrower” associations could be used with the same affect.

ELIMINATING SITUATION: Formal “class-subclass” relations articulated in machine-readable form provide clarity of extension concept meaning.

Situation 3: Unreported high-level subtotals.

Certain financial report line items are required to be reported. For example, the concept “Net Income (Loss)” which represents to total amount of the income statement which is then transferred to equity is generally always reported.

However, many subtotals of that total are reported only subject to the preferences of the person responsible for creating the report. Rather than being pedantic here and provide opinions about arbitrary details, it is more important to focus on the core idea that often certain subtotals are not explicitly reported within a financial statement.

For example, consider the two income statement examples below that are 100% logically equivalent but different (extreme to make a point) in the manner that they represent individual line items.

On the LEFT with the RED heading, certain line items are implied including “Operating Expenses”, “Nonoperating Income (Expenses)”, “Income (Loss) from Continuing Operations Before Tax”, and “Income Tax Expense (Benefit)”. However, on the RIGHT with the GREEN heading, 100% of the implied line items are explicitly reported.

Several Line Items Implied

Implied [Line Items]	Period [Axis]: 2018-01-01/2018-12-31
Net Income (Loss) [Roll Up]	
Gross Profit [Roll Up]	
Sales	4,000
Costs of Sales	2,000
Gross Profit (Loss)	2,000
Depreciation and Amortization	0
Net Income (Loss)	2,000

All Line Items Explicitly Provided

Implied [Line Items]	Period [Axis]: 2018-01-01/2018-12-31
Net Income (Loss) [Roll Up]	
Income (Loss) from Continuing Operations Before Tax [Roll Up]	
Operating Income (Loss) [Roll Up]	
Gross Profit [Roll Up]	
Sales	4,000
Costs of Sales	2,000
Gross Profit (Loss)	2,000
Operating Expenses [Roll Up]	
Depreciation and Amortization	0
Operating Expenses	0
Operating Income (Loss)	2,000
Nonoperating Income (Expenses)	0
Income (Loss) from Continuing Operations Before Tax	2,000
Income Tax Expense (Benefit)	0
Net Income (Loss)	2,000

Now, imagine the needs of a data aggregator which desires to extract information from the income statement on the LEFT and compare that information with the income statement on the RIGHT. There are exactly two approaches that could be used to convert the two reports to one common format, likely the format on the RIGHT which is the most explicit and therefore has the most detail. Remember, computers are dumb beasts and they have to be told exactly what to do in order to achieve a conversion such as this.

Approach 1 would be to write rules for each financial report and convert the report to the desired format. Approach 2 would be to write general rules that could be used universally to convert all financial reports to the same format. (For the time being, imagine that all income statements use the same basic format; the variability of reports will be considered in a separately addressed situation.)

The rules necessary to convert the representation on the LEFT to the representation on the RIGHT can be articulated using XBRL Formula[12].

You will likely note that in this specific XBRL instance, the missing line items from the income statement on the LEFT that do exist in the income statement on the RIGHT do exist within the XBRL instance. But what if the missing line items did not physically exist in the XBRL instance. How then could XBRL formula be used to perform this task? The answer is that an additional step needs to be performed where by the missing facts are derived or imputed from information which does exist within the XBRL instance.

Deriving unreported line items gets more and more complicated when a high number of line items are missing from a report. For example, while it is true that the line item “Income (Loss) from Continuing Operations Before Tax” is not reported on the LEFT and neither is “Income Tax Expense (Benefit)” but you do know the value for “Net Income (Loss)”; you COULD logically deduce that “Income (Loss) from Continuing Operations Before Tax” is the same value as “Net Income (Loss)”. However, because there are two missing pieces of information and if the economic entity either made a mistake or used an extension concept; you could reach an incorrect conclusion.

Further, there is the issue of an economic entity reporting a high-level financial report line item using a more detailed concept. For example, suppose that an economic entity reported the line item “Sales” in the income statement we are showing using a more detailed concept such as “Product Sales”. How would a software application looking for the concept “Sales” understand that “Product Sales” might have been used to report the line item you are looking for?

[12] Fundamental accounting concept relations rules, http://xbrlsite.azurewebsites.net/2019/Prototype/proof/basic-formulas-fac.xml

Finally, there is the issue of using extension concepts, not hooking the extension concepts to a base taxonomy concept and therefore making it additionally challenging to logically deduce the appropriate values for unreported line items in order to convert information to make it comparable to the reported information of another economic entity. Remember, we are assuming that every economic entity uses the state statement format for this situation which (a) makes this process even more challenging and (b) we will address that specific situation within the next section.

ELIMINATING SITUATION: Clearly communicate what concepts might potentially be used to represent high-level financial report line items, provide machine-readable rules to derive unreported high-level financial report line items, and provide machine-readable rules to verify that the high-level financial report line items mathematical relations are intact.

Situation 4: Variability allowed for reporting high-level accounting relationships.

Situation 3 covers the case where you need to convert one financial report logical format to some other logically equivalent financial report format because of (a) unreported subtotals, (b) extension concepts being used, or (c) a more detailed concept is used to report the high-level line item you might expect and need to work with.

In Situation 3 we explicitly made the assumption that every income statement we were considering was logically equivalent. The reason for this was to focus on the pieces of the puzzle that related to unreported high-level financial report line items.

Now in Situation 4 we lift that restriction and ask the question how to you adjust for Situation 3, but now also in an environment when the subtotals used to represent the high-level line items of the balance sheet, income statement, cash flow statement, and statement of comprehensive income are NOT logically equivalent?

For example, in the US GAAP XBRL Taxonomy two balance sheets are provided for: classified and unclassified (or order of liquidity). However, empirical evidence shows[13] that there are 6 and possibly more different varieties of balance sheets. For example, a liquidation basis balance sheet is not provided for by the US GAAP XBRL Taxonomy or is the balance sheet used by a regulated public utility. The situation is similar for income statements, cash flow

[13] US GAAP Reporting Styles Analysis, http://www.xbrlsite.com/2018/10K/US-GAAP-Reporting-Styles.pdf

statements, and statements of comprehensive income. Further, the situation is the same for the IFRS XBRL Taxonomy[14].

Finally, the same rational can be used for different alternative approaches that might be used to represent each possible disclosure reported within the notes to the financial statements.

ELIMINATING SITUATION: In order to successfully overcome the variability allowed in financial reports; each variation of balance sheet, income statement, cash flow statement, and statement of comprehensive income must be explicitly provided for in an XBRL financial reporting base taxonomy. In addition, the rules that define those fundamental high-level accounting relations must be articulated for each variation of each statement.

Situation 5: High-level financial report line item inconsistencies and contradictions.

On occasion, an economic entity creating a financial report will use a concept in an unintended manner and a logical inconsistency and/or logical contradiction will result. While detailed measurements of such high-level fundamental accounting concept relations show that 99.24% of such relations are intact, there are 0.76% that are in error[15]. On a per report basis, 89.1% of all reports have all high-level fundamental accounting concept relations intact whereas 10.9% of reports contain at least one such error.

Here is one example of this situation. Suppose that an economic entity reporting under US GAAP created a properly represented balance sheet. In that economic entity's balance sheet, the line item "Noncurrent assets" (i.e. us-gaap:AssetsNoncurrent) was not explicitly reported. But then, that economic entity in their geographic area disclosure used the concept "us-gaap:AssetsNoncurrent" to report the line item "Long-lived Assets" which SHOULD have been represented using the concept "us-gaap:NoncurrentAssets". Assume that the value of the "Long-lived Assets" amount is different than the value of "Noncurrent assets".

This misused concept (i.e. using "us-gaap:AssetsNoncurrent" when the concept "us-gaap:NoncurrentAssets" should have been used) plus the fact that rules exist to properly derive the value of the line item "Noncurrent assets" if it is NOT reported (however, in this case it actually WAS reported, but in a completely different disclosure) causes an inconsistency and a contradiction between the balance sheet and the geographic areas disclosure.

[14] IFRS Reporting Styles Analysis, http://www.xbrlsite.com/2018/IFRS/IFRS-Reporting-Styles.pdf
[15] *Quarterly XBRL-based Public Company Financial Report Quality Measurement (March 2019),* http://xbrl.squarespace.com/journal/2019/3/29/quarterly-xbrl-based-public-company-financial-report-quality.html

This type of high-level financial report concept inconsistency or contradiction can be eliminated by providing high-level financial report concept relations rules in machine-readable form that can be used by reporting entities to verify that these relations are in fact intact. Further, those same rules can be used by analysts and others extracting information from XBRL-based financial reports to do so effectively, reliably, and consistently. Below is an example of a summary of fundamental accounting concept relations rules. Fundamental accounting concept relations verification is already available within commercial software applications[16].

Entity	Period	ID	Test	Result	Amo...	Evaluation
GH25...	2020-FY	FAC_CONSISTEN...	fac:Equity = (fac:EquityAttributableToParent + fac:EquityAttributableToNoncontrollingInterest)	True	0	fac:Equity[frf-sme:Equity[6,000]] = (fac:EquityAttributableToParent[frf-sme:EquityAttributableToControllingInterest[4,000]] + fac:EquityAttributableToNoncontrollingInterest[frf-sme:EquityAttributableToNoncontrollingInterest[2,000]])
GH25...	2020-FY	FAC_CONSISTEN...	fac:IncomeLossFromContinuingOperationsAfterTax = (fac:IncomeLossFromContinuingOperationsBeforeTax - fac:IncomeTaxExpenseBenefit)	True	0	fac:IncomeLossFromContinuingOperationsAfterTax[frf-sme:IncomeLossFromContinuingOperationsAfterTax[500]] = (fac:IncomeLossFromContinuingOperationsBeforeTax[frf-sme:IncomeLossFromCointinuingOperationsBeforeTax[1,000]] - fac:IncomeTaxExpenseBenefit[frf-sme:IncomeTaxExpenseBenefit[500]])
GH25...	2020-FY	FAC_CONSISTEN...	fac:NetIncomeLoss = (fac:IncomeLossFromContinuingOperationsAfterTax + fac:IncomeLossFromDiscontinuedOperationsNetOfTax)	True	0	fac:NetIncomeLoss[frf-sme:NetIncomeLoss[500]] = (fac:IncomeLossFromContinuingOperationsAfterTax[frf-sme:IncomeLossFromContinuingOperationsAfterTax[500]] + fac:IncomeLossFromDiscontinuedOperationsNetOfTax[frf-sme:IncomeLossFromDiscontinuedOperations[0]])
GH25...	2020-FY	FAC_CONSISTEN...	fac:NetIncomeLoss = (fac:NetIncomeLossAttributableToParent + fac:NetIncomeLossAttributableToNoncontrollingInterest)	True	0	fac:NetIncomeLoss[frf-sme:NetIncomeLoss[500]] = (fac:NetIncomeLossAttributableToParent[500] + fac:NetIncomeLossAttributableToNoncontrollingInterest[0])
GH25...	2020-FY	FAC_CONSISTEN...	fac:Assets = fac:LiabilitiesAndEquity	True	0	fac:Assets[frf-sme:Assets[12,000]] = fac:LiabilitiesAndEquity[frf-sme:LiabilitiesAndEquity[12,000]]
GH25...	2020-FY	FAC_CONSISTEN...	fac:NetCashFlow = (fac:NetCashFlowFromOperatingActivities + fac:NetCashFlowFromInvestingActivities + fac:NetCashFlowFromFinancingActivities)	True	0	fac:NetCashFlow[frf-sme:NetCashFlow[(1,000)]] = (fac:NetCashFlowFromOperatingActivities[frf-sme:NetCashFlowFromUsedInOperatingActivities[(1,000)]] + fac:NetCashFlowFromInvestingActivities[frf-sme:NetCashFlowsFromUsedInInvestingActivities[2,000]] + fac:NetCashFlowFromFinancingActivities[frf-sme:NetCashFlowsFromUsedInFinancingActivities[(2,000)]])
GH25...	2020-FY	FAC_CONSISTEN...	fac:Assets = (fac:CurrentAssets + fac:NoncurrentAssets)	True	0	fac:Assets[frf-sme:Assets[12,000]] = (fac:CurrentAssets[frf-sme:CurrentAssets[5,000]] + fac:NoncurrentAssets[frf-sme:NoncurrentAssets[7,000]])
GH25...	2020-FY	FAC_CONSISTEN...	fac:IncomeLossFromContinuingOperationsBeforeTax = (fac:OperatingAndNonoperatingRevenues - fac:OperatingAndNonoperatingCostsAndExpenses)	True	0	fac:IncomeLossFromContinuingOperationsBeforeTax[frf-sme:IncomeLossFromCointinuingOperationsBeforeTax[1,000]] = (fac:OperatingAndNonoperatingRevenues[frf-sme:RevenueNet[7,000]] - fac:OperatingAndNonoperatingCostsAndExpenses[frf-sme:Expenses[6,000]])
GH25...	2020-FY	FAC_CONSISTEN...	fac:Liabilities = (fac:CurrentLiabilities + fac:NoncurrentLiabilities)	True	0	fac:Liabilities[frf-sme:Liabilities[6,000]] = (fac:CurrentLiabilities[frf-sme:CurrentLiabilities[5,000]] + fac:NoncurrentLiabilities[frf-sme:NoncurrentLiabilities[1,000]])
GH25...	2020-FY	FAC_CONSISTEN...	fac:LiabilitiesAndEquity = (fac:Liabilities + fac:Equity)	True	0	fac:LiabilitiesAndEquity[frf-sme:LiabilitiesAndEquity[12,000]] = (fac:Liabilities[frf-sme:Liabilities[6,000]] + fac:Equity[frf-sme:Equity[6,000]])
GH25...	2020-FY	FAC_CONSISTEN...	fac:NetCashFlowDiscontinued = (fac:NetCashFlowFromOperatingActivitiesDiscontinued + fac:NetCashFlowFromInvestingActivitiesDiscontinued + fac:NetCashFlowFromFinancingActivitiesDiscontinued)	True	0	fac:NetCashFlowDiscontinued[0] = (fac:NetCashFlowFromOperatingActivitiesDiscontinued[0] + fac:NetCashFlowFromInvestingActivitiesDiscontinued[0] + fac:NetCashFlowFromFinancingActivitiesDiscontinued[0])

ELIMINATING SITUATION: Every variation of primary financial statement must have a set of consistency cross check rule that explain those high-level fundamental accounting concept relations of that specific variation and can then be used to make certain that no continuity errors exist because of inconsistent facts or contradictions in reported facts.

[16] Fundamental accounting concept relations validation results for the Microsoft 2017 10-K submitted to the SEC provided by XBRL Cloud, http://xbrlsite.azurewebsites.net/2017/Prototypes/Microsoft2017/evidence-package/#USFACRenderingSummary.html

Situation 6: Presentation relations model structure relations illogical.

On occasion, a relation or association expressed between report elements in the XBRL presentation relations is illogical. While such associations for XBRL calculation relations and XBRL definition relations are enforced by XBRL processors; logic errors in the XBRL presentation relations are not enforced by XBRL processors.

For example, erroneously representing a relationship between say a [Member] and a [Concept] within a set of [Line Items] is completely illogical.

Allowed and disallowed relations between categories of report elements can easily and effectively be represented in the form of a simple table. Alternatively, these relations can also be represented using machine-readable XBRL definition relations[17]. Below is such a table and a report provided by software which shows the relations it has found:

	Parent						
Child	Network	Table	Axis	Member	LineItems	Abstract	Concept
Network	Illegal XBRL	Illegal XBRL	Illegal XBRL	Illegal XBRL	Illegal XBRL	Illegal XBRL	Illegal XBRL
Table	OK	Disallowed	Disallowed	Disallowed	Disallowed	OK	Disallowed
Axis	Disallowed	OK	Disallowed	Disallowed	Disallowed	Disallowed	Disallowed
Member	Disallowed	Disallowed	OK	OK	Disallowed	Disallowed	Disallowed
LineItems	Disallowed	OK	Disallowed	Disallowed	Disallowed	Disallowed	Disallowed
Abstract	OK	Disallowed	Disallowed	Disallowed	OK	OK	Disallowed
Concept	Disallowed	Disallowed	Disallowed	Disallowed	OK	OK	Disallowed

Child	Parent						
	Network	Table	Axis	Member	LineItems	Abstract	Concept
[Network]	0	0	0	0	0	0	0
[Table]	7	0	0	0	0	0	0
[Axis]	0	13	0	0	0	0	0
[Member]	0	0	13	2	0	0	0
[LineItems]	0	7	0	0	0	0	0
[Abstract]	0	0	0	0	9	14	0
[Concept]	0	0	0	0	0	76	0

ELIMINATING SITUATION: A set of allowed relations between the parents and children of each category of report element should be explicitly and unambiguously articulated to those creating XBRL-based reports.

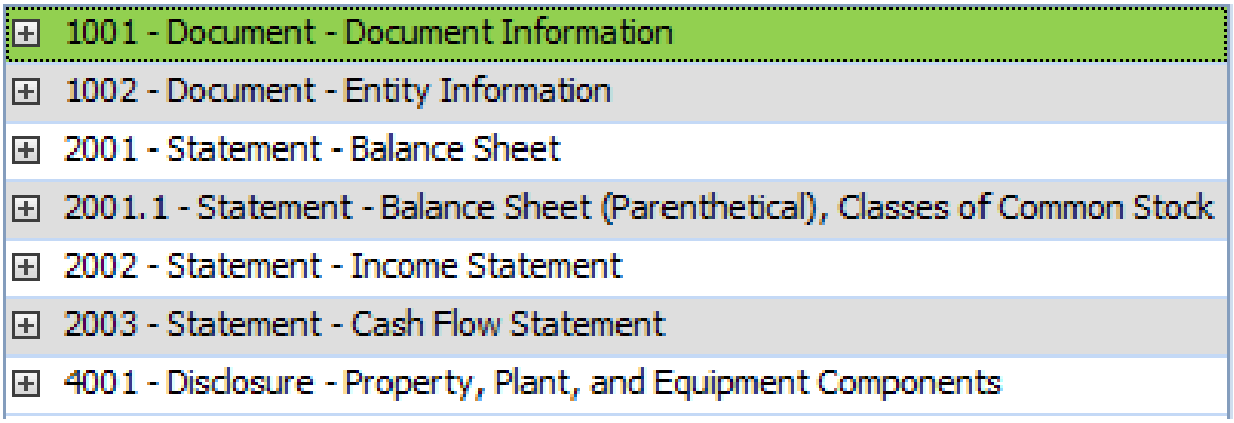
[17] XBRL definition relations that articulate allowed and disallowed relations by report element category, http://xbrlsite.azurewebsites.net/2016/conceptual-model/reporting-scheme/us-gaap/model-structure/ModelStructure-rules-us-gaap-def.xml

Situation 7: Verification that each report fragment is created correctly.

Below is a screen shot of the networks of a rather simple XBRL-based financial report[18]. The simple report was used to demonstrate the notion that 100% of the report fragments (fact sets) which make up the full report can be verified at a very detailed level using automated machine-based processes. This automated verification is enabled using XBRL-based rules represented using the XBRL definition linkbase[19] and some specific arcroles to define the relevant associations.

Yes, for this example there are only 9 report fragments (fact sets). But the Microsoft 2017 10-K has 192 report fragments and this same process works exactly the same way for that Microsoft report or any other US GAAP financial report, for any reporting scheme including US GAAP, IFRS, IPSAS, FRF for SMEs, XASB.

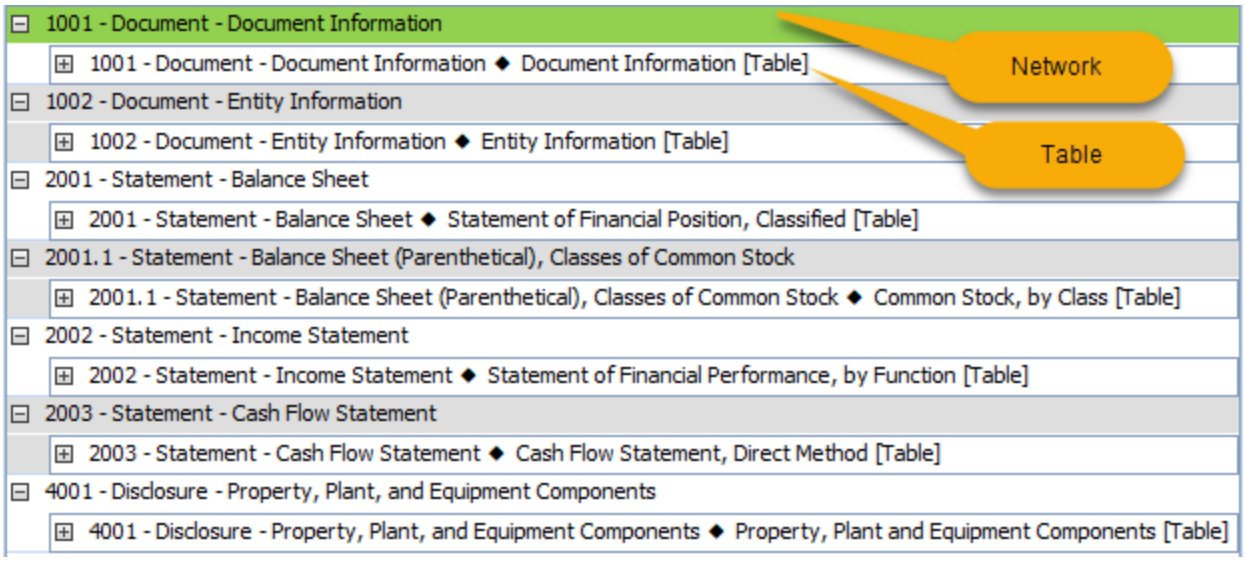
To step through this small report we start at the top of the report. First, an XBRL-based report can contain 1 to many has XBRL Networks. This specific report has SEVEN Networks in the report:



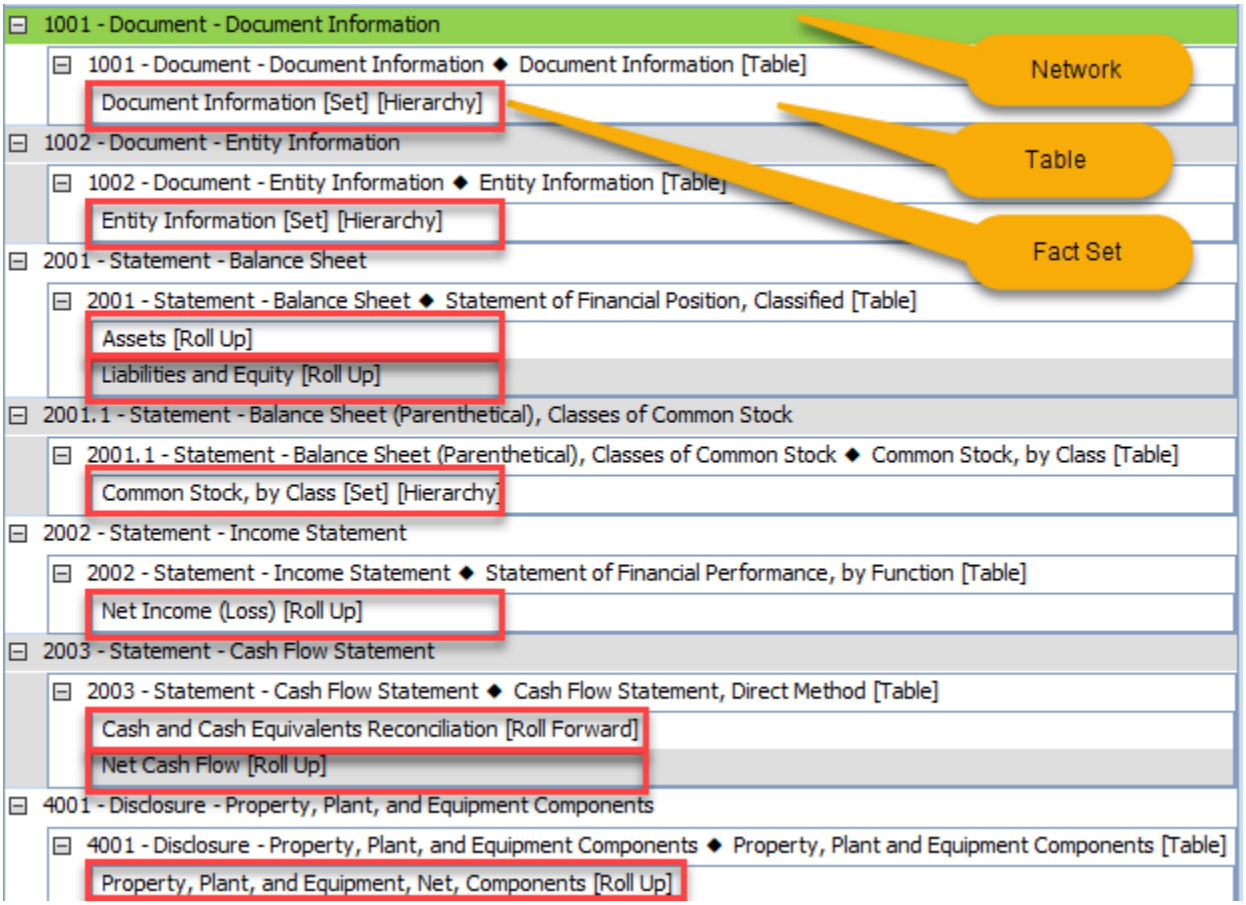
The Networks can contain 1 to many [Table]s (i.e. if there is NOT an explicit [Table]/Hypercube, then one is implied for each network); so here again are the Networks expanded to show each [Table]; each Network has ONE [Table] in this case.

[18] FRF for SMEs reference implementation, http://xbrlsite.azurewebsites.net/2016/conceptual-model/reporting-scheme/frf-sme/reference-implementation/instance.xml

[19] XBRL taxonomy schema that references each of the definition linkbases which contain the rules for disclosure mechanics validation, http://xbrlsite.azurewebsites.net/2016/conceptual-model/reporting-scheme/frf-sme/disclosure-mechanics/disclosure-mechanics.xsd



Each [Table] can have 1 to many Fact Sets. Here, most [Table]s have one fact set, but the balance sheet has two (Assets Roll Up; Liabilities and Equity Roll Up) and the Cash Flow Statement has Two (Net Cash Flow Roll Up; Cash and Cash Equivalents Roll Forward).

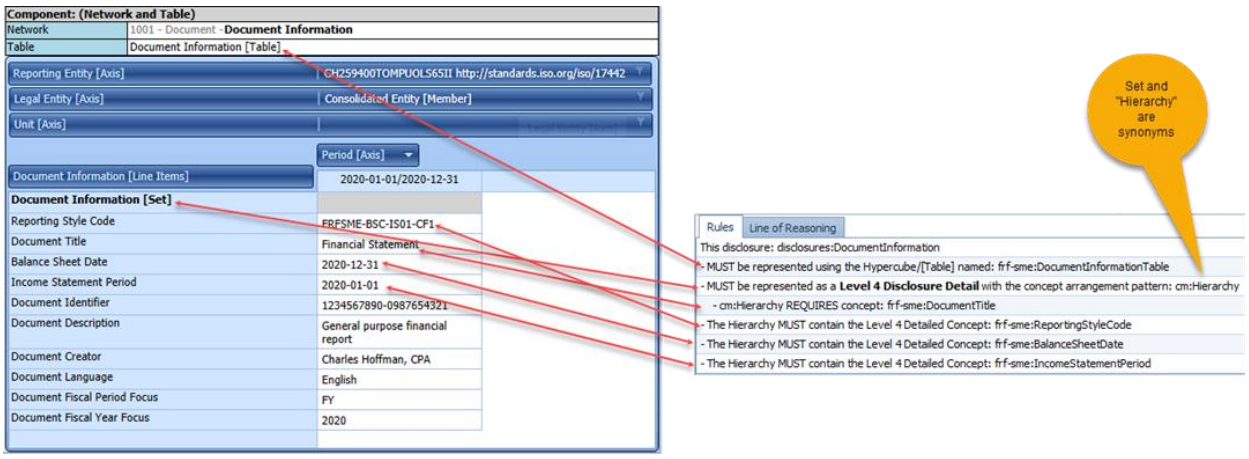


Removing the superfluous structures (Networks, Tables) which are XBRL syntax so that we can focus on the information that has been represented in the report, we have only the Fact Sets of which there are nine:

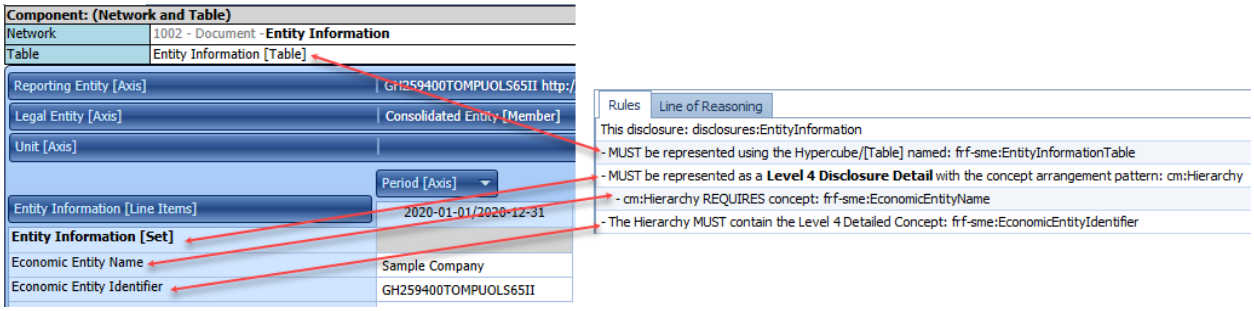
Document Information [Set] [Hierarchy]
Entity Information [Set] [Hierarchy]
Assets [Roll Up]
Liabilities and Equity [Roll Up]
Common Stock, by Class [Set] [Hierarchy]
Net Income (Loss) [Roll Up]
Cash and Cash Equivalents Reconciliation [Roll Forward]
Net Cash Flow [Roll Up]
Property, Plant, and Equipment, Net, Components [Roll Up]

Each **Fact Set** has logical structure rules that can be described using XBRL definition relations (on the right) which explain the disclosure (on the left). Notice also that each computation is verified to be CORRECT by showing GREEN in the cell of the result of the computation. This relationship of a disclosure to the rules used to verify that the disclosure has been created consistently with what is expected for each disclosure in the report. In our case there are nine such fact sets, disclosures, and rules:

Fact Set 1: Document Information [Set]



Fact Set 2: Entity Information [Set]



Component: (Network and Table)	
Network	1002 - Document - **Entity Information**
Table	Entity Information [Table]

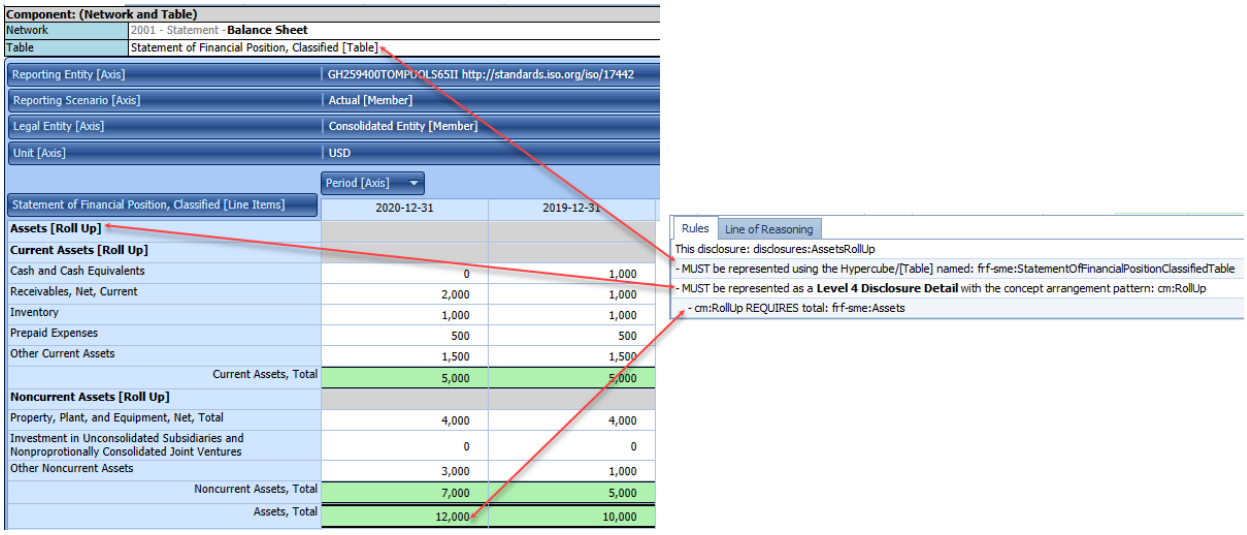
Reporting Entity [Axis]	GH259400TOMPUOLS65II http:/
Legal Entity [Axis]	Consolidated Entity [Member]
Unit [Axis]	

Entity Information [Line Items]	Period [Axis]: 2020-01-01/2020-12-31
Entity Information [Set]	
Economic Entity Name	Sample Company
Economic Entity Identifier	GH259400TOMPUOLS65II

Rules | Line of Reasoning

This disclosure: disclosures:EntityInformation
- MUST be represented using the Hypercube/[Table] named: frf-sme:EntityInformationTable
- MUST be represented as a **Level 4 Disclosure Detail** with the concept arrangement pattern: cm:Hierarchy
- cm:Hierarchy REQUIRES concept: frf-sme:EconomicEntityName
- The Hierarchy MUST contain the Level 4 Detailed Concept: frf-sme:EconomicEntityIdentifier

Fact Set 3: Assets [Roll Up]



Component: (Network and Table)	
Network	2001 - Statement - **Balance Sheet**
Table	Statement of Financial Position, Classified [Table]

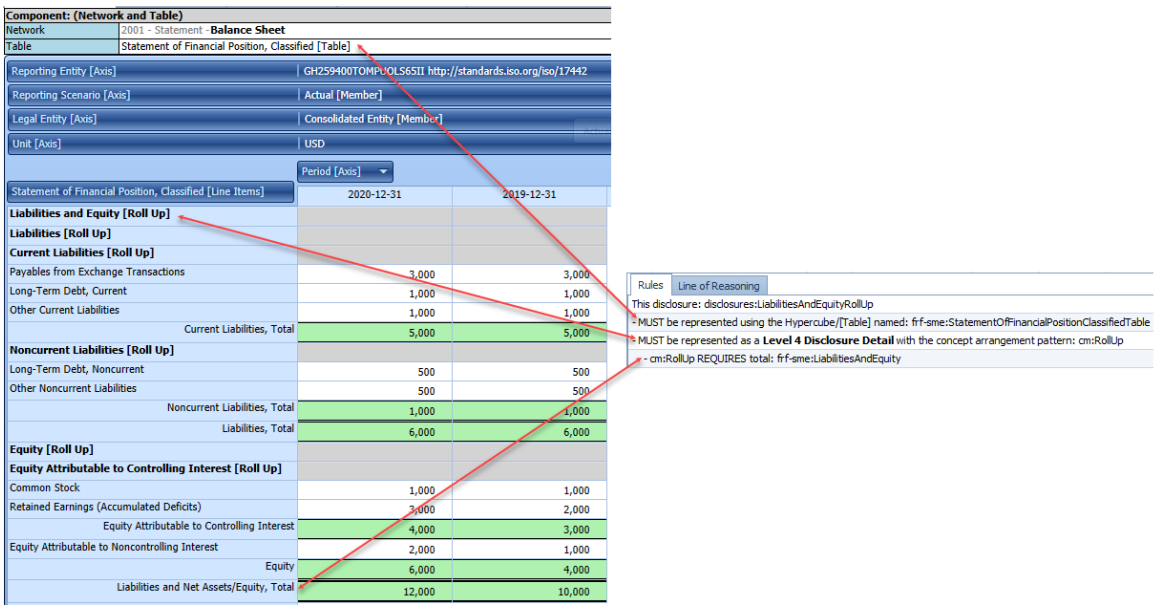
Reporting Entity [Axis]	GH259400TOMPUOLS65II http://standards.iso.org/iso/17442
Reporting Scenario [Axis]	Actual [Member]
Legal Entity [Axis]	Consolidated Entity [Member]
Unit [Axis]	USD

Statement of Financial Position, Classified [Line Items]	Period [Axis]: 2020-12-31	2019-12-31
Assets [Roll Up]		
Current Assets [Roll Up]		
Cash and Cash Equivalents	0	1,000
Receivables, Net, Current	2,000	1,000
Inventory	1,000	1,000
Prepaid Expenses	500	500
Other Current Assets	1,500	1,500
Current Assets, Total	5,000	5,000
Noncurrent Assets [Roll Up]		
Property, Plant, and Equipment, Net, Total	4,000	4,000
Investment in Unconsolidated Subsidiaries and Nonproprotionally Consolidated Joint Ventures	0	0
Other Noncurrent Assets	3,000	1,000
Noncurrent Assets, Total	7,000	5,000
Assets, Total	12,000	10,000

Rules | Line of Reasoning

This disclosure: disclosures:AssetsRollUp
- MUST be represented using the Hypercube/[Table] named: frf-sme:StatementOfFinancialPositionClassifiedTable
- MUST be represented as a **Level 4 Disclosure Detail** with the concept arrangement pattern: cm:RollUp
- cm:RollUp REQUIRES total: frf-sme:Assets

Fact Set 4: Liabilities and Equity [Roll Up]



Component: (Network and Table)	
Network	2001 - Statement - **Balance Sheet**
Table	Statement of Financial Position, Classified [Table]

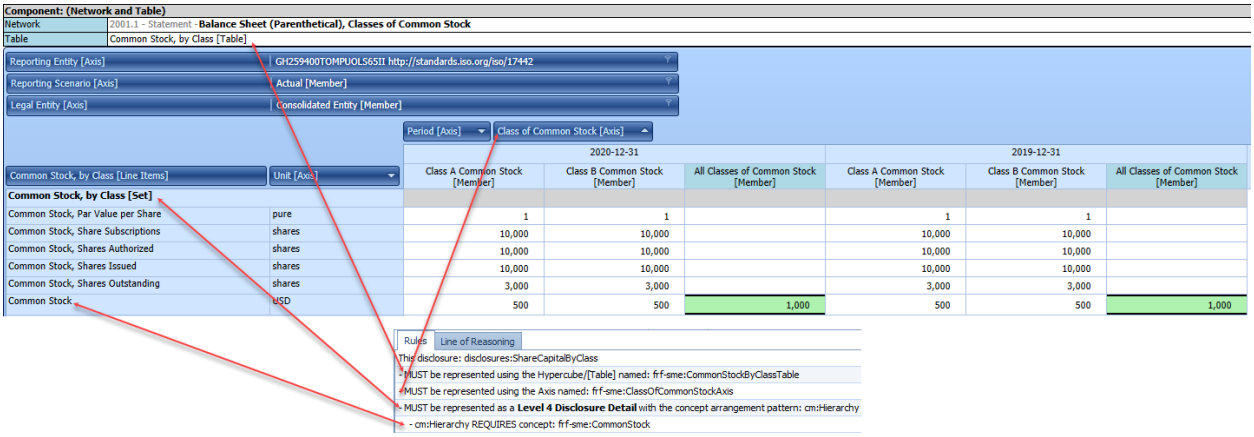
Reporting Entity [Axis]	GH259400TOMPUOLS65II http://standards.iso.org/iso/17442
Reporting Scenario [Axis]	Actual [Member]
Legal Entity [Axis]	Consolidated Entity [Member]
Unit [Axis]	USD

Statement of Financial Position, Classified [Line Items]	Period [Axis]: 2020-12-31	2019-12-31
Liabilities and Equity [Roll Up]		
Liabilities [Roll Up]		
Current Liabilities [Roll Up]		
Payables from Exchange Transactions	3,000	3,000
Long-Term Debt, Current	1,000	1,000
Other Current Liabilities	1,000	1,000
Current Liabilities, Total	5,000	5,000
Noncurrent Liabilities [Roll Up]		
Long-Term Debt, Noncurrent	500	500
Other Noncurrent Liabilities	500	500
Noncurrent Liabilities, Total	1,000	1,000
Liabilities, Total	6,000	6,000
Equity [Roll Up]		
Equity Attributable to Controlling Interest [Roll Up]		
Common Stock	1,000	1,000
Retained Earnings (Accumulated Deficits)	3,000	2,000
Equity Attributable to Controlling Interest	4,000	3,000
Equity Attributable to Noncontrolling Interest	2,000	1,000
Equity	6,000	4,000
Liabilities and Net Assets/Equity, Total	12,000	10,000

Rules | Line of Reasoning

This disclosure: disclosures:LiabilitiesAndEquityRollUp
- MUST be represented using the Hypercube/[Table] named: frf-sme:StatementOfFinancialPositionClassifiedTable
- MUST be represented as a **Level 4 Disclosure Detail** with the concept arrangement pattern: cm:RollUp
- cm:RollUp REQUIRES total: frf-sme:LiabilitiesAndEquity

Fact Set 5: Common Stock, by Class [Set]



Component: (Network and Table)

Network	2001.1 - Statement - **Balance Sheet (Parenthetical), Classes of Common Stock**
Table	Common Stock, by Class [Table]

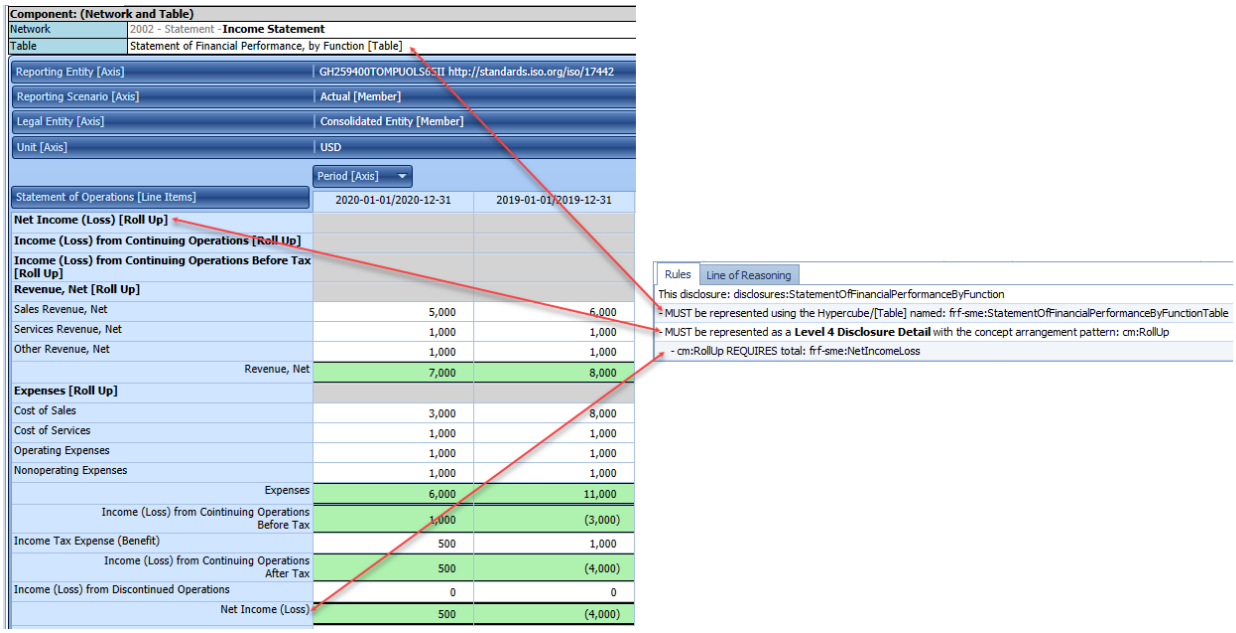
Reporting Entity [Axis]	GH259400TOMPUOLS65II http://standards.iso.org/iso/17442
Reporting Scenario [Axis]	Actual [Member]
Legal Entity [Axis]	Consolidated Entity [Member]

Common Stock, by Class [Line Items]	Unit [Axis]	Period [Axis] / Class of Common Stock [Axis]: 2020-12-31 Class A Common Stock [Member]	2020-12-31 Class B Common Stock [Member]	2020-12-31 All Classes of Common Stock [Member]	2019-12-31 Class A Common Stock [Member]	2019-12-31 Class B Common Stock [Member]	2019-12-31 All Classes of Common Stock [Member]
Common Stock, by Class [Set]							
Common Stock, Par Value per Share	pure	1	1		1	1	
Common Stock, Share Subscriptions	shares	10,000	10,000		10,000	10,000	
Common Stock, Shares Authorized	shares	10,000	10,000		10,000	10,000	
Common Stock, Shares Issued	shares	10,000	10,000		10,000	10,000	
Common Stock, Shares Outstanding	shares	3,000	3,000		3,000	3,000	
Common Stock	USD	500	500	1,000	500	500	1,000

Rules | Line of Reasoning

This disclosure: disclosures:ShareCapitalByClass
- MUST be represented using the Hypercube/[Table] named: frf-sme:CommonStockByClassTable
- MUST be represented using the Axis named: frf-sme:ClassOfCommonStockAxis
- MUST be represented as a **Level 4 Disclosure Detail** with the concept arrangement pattern: cm:Hierarchy
- cm:Hierarchy REQUIRES concept: frf-sme:CommonStock

Fact Set 6: Net Income (Loss) [Roll Up]



Component: (Network and Table)

Network	2002 - Statement - **Income Statement**
Table	Statement of Financial Performance, by Function [Table]

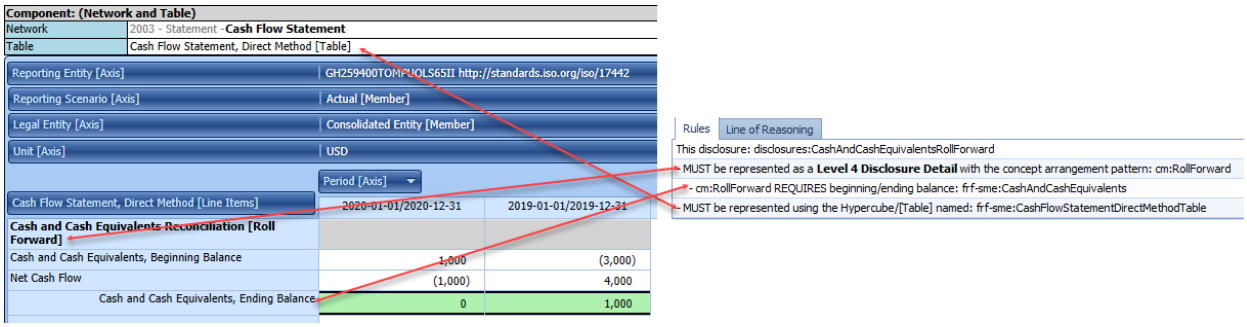
Reporting Entity [Axis]	GH259400TOMPUOLS65II http://standards.iso.org/iso/17442
Reporting Scenario [Axis]	Actual [Member]
Legal Entity [Axis]	Consolidated Entity [Member]
Unit [Axis]	USD

Statement of Operations [Line Items]	Period [Axis]: 2020-01-01/2020-12-31	2019-01-01/2019-12-31
Net Income (Loss) [Roll Up]		
Income (Loss) from Continuing Operations [Roll Up]		
Income (Loss) from Continuing Operations Before Tax [Roll Up]		
Revenue, Net [Roll Up]		
Sales Revenue, Net	5,000	6,000
Services Revenue, Net	1,000	1,000
Other Revenue, Net	1,000	1,000
Revenue, Net	7,000	8,000
Expenses [Roll Up]		
Cost of Sales	3,000	8,000
Cost of Services	1,000	1,000
Operating Expenses	1,000	1,000
Nonoperating Expenses	1,000	1,000
Expenses	6,000	11,000
Income (Loss) from Cointinuing Operations Before Tax	1,000	(3,000)
Income Tax Expense (Benefit)	500	1,000
Income (Loss) from Continuing Operations After Tax	500	(4,000)
Income (Loss) from Discontinued Operations	0	0
Net Income (Loss)	500	(4,000)

Rules | Line of Reasoning

This disclosure: disclosures:StatementOfFinancialPerformanceByFunction
- MUST be represented using the Hypercube/[Table] named: frf-sme:StatementOfFinancialPerformanceByFunctionTable
- MUST be represented as a **Level 4 Disclosure Detail** with the concept arrangement pattern: cm:RollUp
- cm:RollUp REQUIRES total: frf-sme:NetIncomeLoss

Fact Set 7: Cash and Cash Equivalents [Roll Forward]



Component: (Network and Table)

Network	2003 - Statement - **Cash Flow Statement**
Table	Cash Flow Statement, Direct Method [Table]

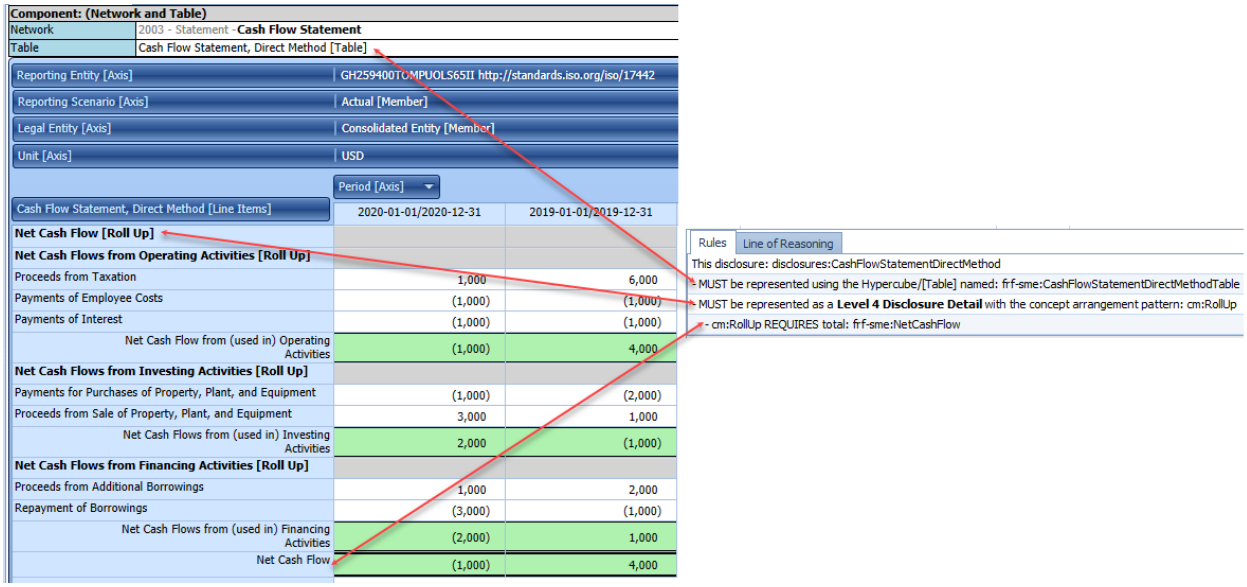
Reporting Entity [Axis]	GH259400TOMPUOLS65II http://standards.iso.org/iso/17442
Reporting Scenario [Axis]	Actual [Member]
Legal Entity [Axis]	Consolidated Entity [Member]
Unit [Axis]	USD

Cash Flow Statement, Direct Method [Line Items]	Period [Axis]: 2020-01-01/2020-12-31	2019-01-01/2019-12-31
Cash and Cash Equivalents Reconciliation [Roll Forward]		
Cash and Cash Equivalents, Beginning Balance	1,000	(3,000)
Net Cash Flow	(1,000)	4,000
Cash and Cash Equivalents, Ending Balance	0	1,000

Rules | Line of Reasoning

This disclosure: disclosures:CashAndCashEquivalentsRollForward
- MUST be represented as a **Level 4 Disclosure Detail** with the concept arrangement pattern: cm:RollForward
- cm:RollForward REQUIRES beginning/ending balance: frf-sme:CashAndCashEquivalents
- MUST be represented using the Hypercube/[Table] named: frf-sme:CashFlowStatementDirectMethodTable

Fact Set 8: Net Cash Flow [Roll Up]



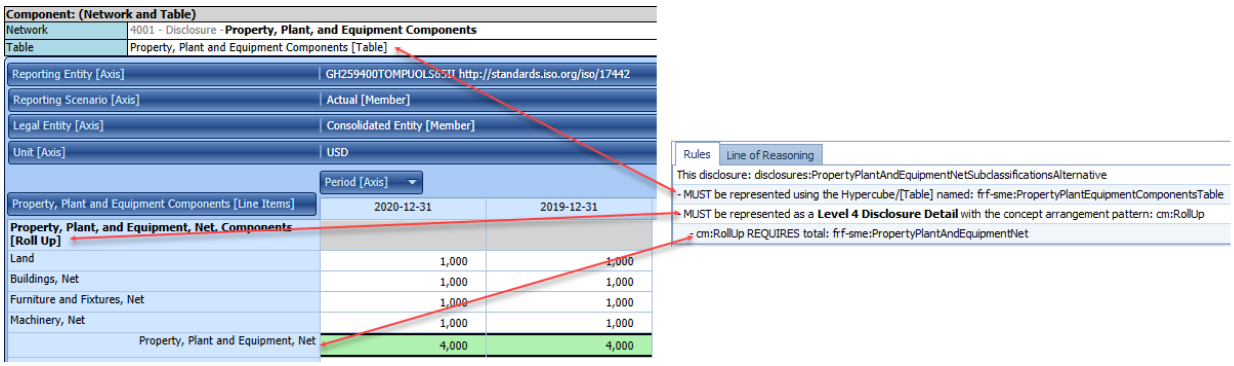
Component: (Network and Table)	
Network	2003 - Statement - **Cash Flow Statement**
Table	Cash Flow Statement, Direct Method [Table]
Reporting Entity [Axis]	GH259400TOMPUOLS65II http://standards.iso.org/iso/17442
Reporting Scenario [Axis]	Actual [Member]
Legal Entity [Axis]	Consolidated Entity [Member]
Unit [Axis]	USD

Cash Flow Statement, Direct Method [Line Items]	Period [Axis]: 2020-01-01/2020-12-31	2019-01-01/2019-12-31
Net Cash Flow [Roll Up]		
Net Cash Flows from Operating Activities [Roll Up]		
Proceeds from Taxation	1,000	6,000
Payments of Employee Costs	(1,000)	(1,000)
Payments of Interest	(1,000)	(1,000)
Net Cash Flow from (used in) Operating Activities	(1,000)	4,000
Net Cash Flows from Investing Activities [Roll Up]		
Payments for Purchases of Property, Plant, and Equipment	(1,000)	(2,000)
Proceeds from Sale of Property, Plant, and Equipment	3,000	1,000
Net Cash Flows from (used in) Investing Activities	2,000	(1,000)
Net Cash Flows from Financing Activities [Roll Up]		
Proceeds from Additional Borrowings	1,000	2,000
Repayment of Borrowings	(3,000)	(1,000)
Net Cash Flows from (used in) Financing Activities	(2,000)	1,000
Net Cash Flow	(1,000)	4,000

Rules | Line of Reasoning

This disclosure: disclosures:CashFlowStatementDirectMethod
- MUST be represented using the Hypercube/[Table] named: frf-sme:CashFlowStatementDirectMethodTable
- MUST be represented as a **Level 4 Disclosure Detail** with the concept arrangement pattern: cm:RollUp
- cm:RollUp REQUIRES total: frf-sme:NetCashFlow

Fact Set 9: Property, Plant and Equipment, Net Components [Roll Up]



Component: (Network and Table)	
Network	4001 - Disclosure - **Property, Plant, and Equipment Components**
Table	Property, Plant and Equipment Components [Table]
Reporting Entity [Axis]	GH259400TOMPUOLS65II http://standards.iso.org/iso/17442
Reporting Scenario [Axis]	Actual [Member]
Legal Entity [Axis]	Consolidated Entity [Member]
Unit [Axis]	USD

Property, Plant and Equipment Components [Line Items]	Period [Axis]: 2020-12-31	2019-12-31
Property, Plant, and Equipment, Net, Components [Roll Up]		
Land	1,000	1,000
Buildings, Net	1,000	1,000
Furniture and Fixtures, Net	1,000	1,000
Machinery, Net	1,000	1,000
Property, Plant and Equipment, Net	4,000	4,000

Rules | Line of Reasoning

This disclosure: disclosures:PropertyPlantAndEquipmentNetSubclassificationsAlternative
- MUST be represented using the Hypercube/[Table] named: frf-sme:PropertyPlantEquipmentComponentsTable
- MUST be represented as a **Level 4 Disclosure Detail** with the concept arrangement pattern: cm:RollUp
- cm:RollUp REQUIRES total: frf-sme:PropertyPlantAndEquipmentNet

Something is worth pointing out. While the example might seem simplistic it is not simplistic at all. Every XBRL-based financial report can be broken down into about 10 rule patterns that all disclosures follow. This is the case for US GAAP, IFRS, IPSAS, FRF for SMEs, or any other financial reporting scheme for that matter. If it is the case that some pattern is missing, that pattern can easily be added to the set of 10 existing fact set patterns. Even if another 10 or perhaps 20 or maybe even 100 different patterns were found, this same logic will still apply. As Steve Jobs points out, “Simple is the ultimate sophistication.” What you see here is not simplistic, it is actually rather complex but the complexity is hidden from the users of the software tools.

Commercially available software can already verify these sorts of structural, accounting, and other logical relations to the extent that machine-readable rules exist. The Microsoft 2017 10-K has 192 fact sets of which approximately 70 rules are available for US GAAP[20].

ELIMINATING SITUATION: Provide a set of rules that articulate the key logical aspects of each report fragment that is to be reported. To achieve this, each disclosure must be named in order to organize this information and rules are then associated with each specific named disclosure using XBRL definition relations.

Situation 8: Mathematical relations are not explained using machine-readable rules and then verified against that machine-readable explanation.

Considering the fact sets provided in Situation 7 again to explain this situation; there are three categories of mathematical relations that are represented in the simple example provided:

- Roll ups
- Roll forwards
- Aggregation of a set of members across an [Axis]

Current practice is for the US GAAP XBRL Taxonomy to provide only machine-readable rules for roll ups. Similarly, the SEC requires rules only for roll ups to be provided with reports.

This practice allows mathematical errors to exist in XBRL-based financial reports because many mathematical relations go untested to be certain that the mathematical relations are, in fact, correct. No one disputes that there are many mathematical errors in the XBRL-based reports that are submitted to the SEC. It is trivial to see such errors using the empirical evidence.

XBRL Formula is perfectly capable of representing mathematical relations for roll ups, roll forwards, aggregations of a set of members across an [Axis], and other such mathematical relations.

ELIMINATING SITUATION: Each report should provide machine-readable rules that can be used to explain the mathematical relations that exist in a report and to verify that the information in the report is consistent with those explanations.

[20] Verification of disclosures for Microsoft 2017 10-K submitted to SEC, http://xbrlsite.azurewebsites.net/2017/Prototypes/Microsoft2017/Disclosure%20Mechanics%20and%20Reporting%20Checklist.html

Situation 9: Verification that each report fragment that is required to be disclosure exists within the financial report.

Each financial report has disclosures that are always required to be disclosed such as a balance sheet, income statement, cash flow statement, statement of changes in equity, basis of reporting, nature of operations, and significant accounting policies.

Other disclosures are required if some line item exists on a financial statement such as the balance sheet, income statement, or cash flow statement. For example, inventory subclassifications is required to be disclosed if the line item "Inventories" is reported on the balance sheet. Or, property, plant and equipment subclassifications if the line item "Property, plant and equipment" appears on the balance sheet. Clearly materiality always comes into play in determining what disclosures are or are not required.

Sometimes a disclosure is required if some other disclosure is provided. Or, a policy is required if a specific line item is reported.

Many of these rules can be represented in the form of a machine-readable reporting checklist or disclosure checklist. The machine-readable information can be rendered using computer algorithms in easy to understand information that humans can consume.

Here is an example of such a machine-readable reporting checklist[21] that can also be read and understood by humans[22]:

[21] Machine-readable version of reporting checklist, http://xbrlsite.azurewebsites.net/2016/conceptual-model/reporting-scheme/xasb/reporting-checklist/ReportingChecklist-xasb-rules-def.xml
[22] Human readable reporting checklist and disclosure mechanics rules for the Microsoft 2017 10-K, http://xbrlsite.azurewebsites.net/2017/Prototypes/Microsoft2017/Disclosure%20Mechanics%20and%20Reporting%20Checklist.html

Primary Information

#	Disclosure	Category	Level	Pattern	Disclosure Found	Disclosure Cons...	Applicable	Representation Concept [TEXT BLOCK]	Representation Concept DETAIL
1	Assets [Roll Up]	Unknown	Level4Detail	RollUp	True	CONSISTENT	True	NOT-EXPECTED	Assets
2	Balance Sheet	Statement	Level4Detail	Component	True	CONSISTENT	True	-	-
3	Basis of Reporting	Unknown	Level1TextBlock	TextBlock	True	CONSISTENT	True	Overall Financial Report Presentation and Display [HTML]	NOT-EXPECTED
4	Buildings [Roll Forward]	Unknown	Level3TextBlock/Level4Detail	RollForward	True	CONSISTENT	True	Property, Plant, and Equipment Roll Forward [Schedule]	Buildings, Net
5	Business Segments	Unknown		Component	False	N/A	False	-	-
6	Business Segments, Assets [Roll Up]	Unknown	Level3TextBlock/Level4Detail	RollUp	True	N/A	False	Business Segments, Assets [Schedule]	Assets
7	Business Segments, Depreciation and Amortizatio...	Unknown	Level3TextBlock/Level4Detail	RollUp	True	N/A	False	Business Segments, Depreciation and Amortization [Schedule]	Depreciation and Amortization
8	Business Segments, Liabilities [Roll Up]	Unknown	Level3TextBlock/Level4Detail	RollUp	True	N/A	False	Business Segments, Liabilities [Schedule]	Liabilities
9	Business Segments, Other Information [Hierarchy]	Unknown	Level3TextBlock/Level4Detail	Hierarchy	True	N/A	False	Business Segments, Other Information [Schedule]	Capital Additions
10	Business Segments, Result [Roll Up]	Unknown	Level3TextBlock/Level4Detail	RollUp	True	N/A	False	Business Segments, Result [Schedule]	Net Income (Loss)
11	Business Segments, Revenues [Roll Up]	Unknown	Level3TextBlock/Level4Detail	RollUp	True	N/A	False	Business Segments, Revenues [Schedule]	Revenues, Net
12	Cash and Cash Equivalents Components	Unknown	Level3TextBlock/Level4Detail	RollUp	True	CONSISTENT	True	Cash and Cash Equivalents Components [Schedule]	Cash and Cash Equivalents
13	Cash Flow Statement, Direct Method	Unknown	Level4Detail	RollUp	True	CONSISTENT	True	NOT-EXPECTED	Cash Flow, Net
14	Common Stock, By Class	Unknown	Level3TextBlock/Level4Detail	Hierarchy	True	CONSISTENT	True	Common Stock by Class [Schedule]	Common Stock
15	Director Compensation	Unknown	Level3TextBlock/Level4Detail	RollUp	True	CONSISTENT	True	Directors Compensation [Schedule]	Director Salary, Bonuses, and Fees
16	Director Compensation, Options Granted	Unknown	Level3TextBlock/Level4Detail	Hierarchy	True	CONSISTENT	True	Directors Compensation Options Granted [Schedule]	Director Options Granted, at Fair Value
17	Document Information	Unknown	Level4Detail	Hierarchy	True	CONSISTENT	True	NOT-EXPECTED	Document Title
18	Earnings Per Share Summary	Unknown	Level4Detail	Hierarchy	True	CONSISTENT	True	NOT-EXPECTED	Earnings (Loss) per Share
19	Entity Address	Unknown	Level4Detail	Hierarchy	True	CONSISTENT	True	NOT-EXPECTED	Street 1
20	Entity Information	Unknown	Level4Detail	Hierarchy	True	CONSISTENT	True	NOT-EXPECTED	Economic Entity Name
21	Financial Highlights	Unknown	Level3TextBlock/Level4Detail	Hierarchy	True	CONSISTENT	True	Financial Highlights [HTML]	Revenues, Net
22	Furniture and Fixtures [Roll Forward]	Unknown	Level3TextBlock/Level4Detail	RollForward	True	CONSISTENT	True	Property, Plant, and Equipment Roll Forward [Schedule]	Furniture and Fixtures, Net
23	Income Statement	Unknown	Level4Detail	RollUp	True	CONSISTENT	True	NOT-EXPECTED	Net Income (Loss)
24	Income Tax Expense (Benefit) Components	Unknown	Level3TextBlock/Level4Detail	RollUp	True	CONSISTENT	True	Income Tax Expense (Benefit) Components [Schedule]	Income Tax Expense (Benefit)
25	Inventory Components	Unknown	Level3TextBlock/Level4Detail	RollUp	True	CONSISTENT	True	Inventory Components [Schedule]	Inventory
26	Investment	Unknown	Level3TextBlock/Level4Detail	Hierarchy	True	CONSISTENT	True	Investments [Schedule]	Investments, at Cost
27	Land [Roll Forward]	Unknown	Level3TextBlock/Level4Detail	RollForward	True	CONSISTENT	True	Property, Plant, and Equipment Roll Forward [Schedule]	Land
28	Leasehold, Land, and Building	Unknown	Level3TextBlock/Level4Detail	Hierarchy	True	CONSISTENT	True	Leasehold Land and Buildings [Schedule]	Leasehold Land and Building, Value at Cost
29	Liabilities and Equity [Roll Up]	Unknown	Level4Detail	RollUp	True	CONSISTENT	True	NOT-EXPECTED	Liabilities and Equity
30	Long-Term Debt Components	Unknown	Level3TextBlock/Level4Detail	RollUp	True	CONSISTENT	True	Long-Term Debt Components [Schedule]	Long-Term Debt
31	Long-Term Debt Current and Noncurrent Portions	Unknown	Level3TextBlock/Level4Detail	RollUp	True	CONSISTENT	True	Long-Term Debt Current and Noncurrent Breakdown [Schedule]	Long-Term Debt
32	Long-Term Debt Instruments	Unknown	Level3TextBlock/Level4Detail	Hierarchy	True	CONSISTENT	True	Long-Term Debt Instruments [Schedule]	Debt Instrument, Description
33	Long-Term Debt Maturities	Unknown	Level3TextBlock/Level4Detail	RollUp	True	CONSISTENT	True	Long-Term Debt Maturities [Schedule]	Long-Term Debt
34	Nature of Operations	Unknown	Level1TextBlock	TextBlock	True	CONSISTENT	True	Nature of Business [HTML]	NOT-EXPECTED
35	Other Assets Current and Noncurrent Portions	Unknown	Level3TextBlock/Level4Detail	RollUp	True	CONSISTENT	True	Other Assets, Current and Noncurrent Portion [Schedule]	Other Assets
36	Other Liabilities Current and Noncurrent Breakdown	Unknown	Level3TextBlock/Level4Detail	RollUp	True	CONSISTENT	True	Other Liabilities Current and Noncurrent Breakdown [Schedule]	Other Liabilities
37	Other Property, Plant, and Equipment [Roll Forwa...	Unknown	Level3TextBlock/Level4Detail	RollForward	True	CONSISTENT	True	Property, Plant, and Equipment Roll Forward [Schedule]	Other Property, Plant, and Equipment, Net
38	Payables and Accruals Components	Unknown	Level3TextBlock/Level4Detail	RollUp	True	CONSISTENT	True	Payables and Accruals Components [Schedule]	Payables and Accruals
39	Preferred Stock Changes [Roll Forward]	Unknown	Level4Detail	RollForward	True	CONSISTENT	True	NOT-EXPECTED	Preferred Stock
40	Preferred Stock, By Class	Unknown	Level3TextBlock/Level4Detail	Hierarchy	True	CONSISTENT	True	Preferred Stock by Class [Schedule]	Preferred Stock
41	Prepaid Expenses	Unknown	Level3TextBlock/Level4Detail	RollUp	True	CONSISTENT	True	Prepaid Expenses Components [Schedule]	Prepaid Expenses
42	Property, Plant, and Equipment Components	Unknown	Level3TextBlock/Level4Detail	RollUp	True	CONSISTENT	True	Property, Plant, and Equipment Components [Schedule]	Property, Plant and Equipment, Net
43	Property, Plant, and Equipment Estimated Useful ...	Unknown	Level3TextBlock/Level4Detail	Hierarchy	True	CONSISTENT	True	Property, Plant, and Equipment Estimated Useful Lives [Schedule]	Property, Plant and Equipment, Estimated Useful Life
44	Property, Plant, and Equipment Roll Forward	Unknown	Level3TextBlock/Level4Detail	RollForward	True	CONSISTENT	True	Property, Plant, and Equipment Roll Forward [Schedule]	Property, Plant and Equipment, Net
45	Receivables Details, By Component	Unknown	Level3TextBlock/Level4Detail	RollUp	True	CONSISTENT	True	Receivables, by Component [Schedule]	Receivables, Net, Current
46	Receivables Details, Current and Noncurrent	Unknown	Level3TextBlock/Level4Detail	RollUp	True	CONSISTENT	True	Receivables, Current and Noncurrent [Schedule]	Receivables, Net
47	Receivables Details, Gross, Net	Unknown	Level3TextBlock/Level4Detail	RollUp	True	CONSISTENT	True	Receivables, Net and Gross [Schedule]	Receivables, Net
48	Reconciliation of Cash Summary	Unknown	Level3TextBlock/Level4Detail	RollUp	True	CONSISTENT	True	Reconciliation of to Cash Flow Statement, Summary [Schedule]	Cash and Cash Equivalents, per Cash Flow Statement
49	Reconciling Item of Cash and Cash Equivalents	Unknown	Level3TextBlock/Level4Detail	Hierarchy	True	CONSISTENT	True	Reconciliation of to Cash Flow Statement, Detail [Schedule]	Reconciling Item, Amount
50	Related Party	Unknown	Level3TextBlock/Level4Detail	Hierarchy	True	CONSISTENT	True	Related Parties [Schedule]	Related Party, Nature of Relationship
51	Related Party Transaction	Unknown	Level3TextBlock/Level4Detail	Hierarchy	True	CONSISTENT	True	Related Party Trasactions [Schedule]	Related Party Transaction, Amount
52	Sales Analysis, by Customer	Unknown	Level3TextBlock/Level4Detail	Hierarchy	True	CONSISTENT	True	Sales Analysis by Customer [Schedule]	Revenues, Net
53	Share Ownership Plan Stock Options Outstanding	Unknown	Level3TextBlock/Level4Detail	RollForward	True	CONSISTENT	True	Share Options Outstanding Roll Forward [Schedule]	Share Ownership Plan, Share Options Outstanding
54	Significant Accounting Policies	Unknown	Level1TextBlock	TextBlock	True	CONSISTENT	True	Significant Accounting Policies [Note]	NOT-EXPECTED
55	Statement of Changes in Equity	Unknown	Level4Detail	RollForward	True	CONSISTENT	True	NOT-EXPECTED	Equity
56	Statement of Changes in Equity, Common Stock b...	Unknown	Level3TextBlock/Level4Detail	RollForward	True	CONSISTENT	True	Common Stock Shares Outstanding Roll Forward [Schedule]	Common Stock, Shares Outstanding
57	Statement of Changes in Equity, Preferred Stock ...	Unknown	Level3TextBlock/Level4Detail	RollForward	True	CONSISTENT	True	Preferred Stock Shares Outstanding Roll Forward [Schedule]	Preferred Stock, Shares Outstanding
58	Statement of Changes in Equity, Prior Period Adju...	Unknown	Level4Detail	Adjustment	True	CONSISTENT	True	NOT-EXPECTED	Retained Earnings (Accumulated Losses)
59	Subsequent Event	Unknown	Level3TextBlock/Level4Detail	Hierarchy	True	CONSISTENT	True	Subsequent Events [Schedule]	Subsequent Event, Description
60	Variance Analysis Gross Profit	Unknown	Level3TextBlock/Level4Detail	Variance	True	CONSISTENT	True	Variance Analysis [Schedule]	Gross Profit (Loss)

ELIMINATING SITUATION: Provide a set of rules that explain when specific disclosures are expected to be provided within a financial report which can be used by software applications to verify consistency of the report to what is expected per the machine-readable explanation.