Financial Report Proof

Rigorously and methodically verifying the precision and coverage of an XBRL-based financial report

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"He who loves practice without theory is like the sailor who boards a ship without a rudder and compass and never knows where he may cast." *Leonardo da Vinci*

Executive summary:

- An XBRL-based financial report must be proven to be a properly functioning logical system.
- This document shows how to provide that proof.
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The purpose of this document is to explain how to rigorously and methodically verify that an XBRL-based financial report is a properly functioning logical system.

A basic XBRL-based financial report is used to explain the things that need to be considered so that you can prove to yourself that such a report is a properly functioning logical system.

Set of Fact Sets within an XBRL-based Report

From a presentation perspective, an XBRL-based report can be viewed as a set of XBRL networks and/or a set of networks/tables.

But from the perspective of the representation of information, the least common denominator is the **fact set** (a.k.a. Block)[1]. Here are the set of fact sets (i.e. blocks) for the report we are endeavoring to prove that are properly functioning to show that the entire report is properly functioning:

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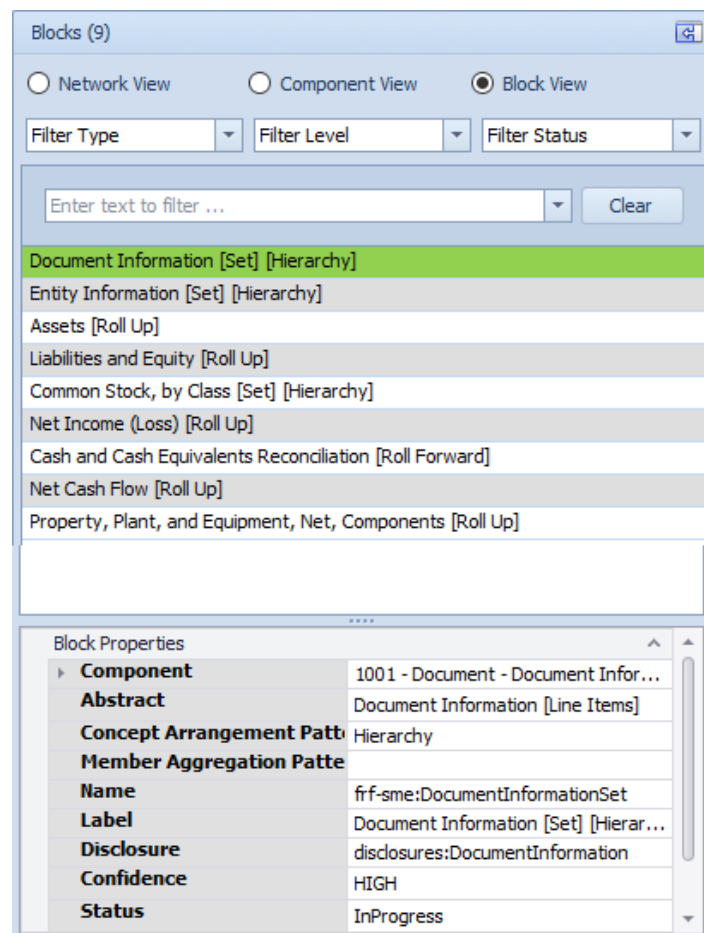
[1] Charles Hoffman, CPA, *Narrative Explaining Logical Conceptualization of a Financial Report*, http://xbrlsite.azurewebsites.net/2019/Framework/NarrativeConceptualization.pdf

As can be seen, there are a total of nine fact sets that need to be proven to be correct. Further, it is also important to be sure that the information represented within one fact set does not contradict information reported within other fact sets.

Disclosure Mechanics

One aspect of proving that a report is properly functioning is to prove that each fact set is properly functioning per a set of disclosure mechanics rules for each fact set. We will start by proving the first fact set and then iteratively prove each of the nine different fact sets within this XBRL-based report.

(1) Document Information [Set]

A set of disclosure mechanics rules are provided for the document information fact set. The report is consistent with those disclosure mechanics rules.

This is the rendering of this fact set:

Reporting Entity [Axis]	GH259400TOMPUOLS65II http://standards.iso.org/iso/17442
Legal Entity [Axis]	Consolidated Entity [Member]
Period [Axis]	2020-01-01/2020-12-31
Unit [Axis]	

	Drop Column Fields Here
Document Information [Line Items]	Fact Value
Document Information [Set]	
Reporting Style Code	FRFSME-BSC-IS01-CF1
Document Title	Financial Statement
Balance Sheet Date	2020-12-31
Income Statement Period	2020-01-01
Document Identifier	1234567890-0987654321
Document Description	General purpose financial report
Document Creator	Charles Hoffman, CPA
Document Language	English
Document Fiscal Period Focus	FY
Document Fiscal Year Focus	2020

(2) Entity Information [Set]

A set of disclosure mechanics rules are provided for the entity information fact set. The report is consistent with those disclosure mechanics rules.

#	Disclosure	Category	Level	Pattern	Disclosure Found	Disclosure Consistent	Applicable	Representation Concept [TEXT BLOCK]	Representation Concept DETAIL
5	Entity Information	Unknown	Level4Detail	Hierarchy	True	CONSISTENT	True	NOT-EXPECTED	Economic Entity Name

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

This is the rendering of this fact set:

Reporting Entity [Axis]	GH259400TOMPUOLS65II http://standards.iso.org/iso/17442
Legal Entity [Axis]	Consolidated Entity [Member]
Period [Axis]	2020-01-01/2020-12-31
Unit [Axis]	

	Drop Column Fields Here
Entity Information [Line Items]	Fact Value
Entity Information [Set]	
Economic Entity Name	Sample Company
Economic Entity Identifier	GH259400TOMPUOLS65II

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(3) Assets [Roll Up]

A set of disclosure mechanics rules are provided for the assets roll up fact set. The report is consistent with those disclosure mechanics rules.

#	Disclosure	Category	Level	Pattern	Disclosure Found	Disclosure Consistent	Applicable	Representation Concept [TEXT BLOCK]	Representation Concept DETAIL
1	Assets Roll Up	Unknown	Level4Detail	RollUp	True	CONSISTENT	True	NOT-EXPECTED	Assets

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

This is the rendering of this fact set:

Reporting Entity [Axis]	GH259400TOMPUOLS65II http://standards.iso.org/iso/17442	
Reporting Scenario [Axis]	Actual [Member]	
Legal Entity [Axis]	Consolidated Entity [Member]	
Unit [Axis]	USD	
	Period [Axis] ▼	
Statement of Financial Position, Classified [Line Items]	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

Note that the fragment is created consistently with the disclosure mechanics rules and that the mathematical computations are as expected as can be seen by the GREEN coloring of the cells that contain mathematical computations, in this case roll ups.

(4) Liabilities and Equity [Roll Up]

A set of disclosure mechanics rules are provided for the liabilities and equity roll up fact set. The report is consistent with those disclosure mechanics rules.

Primary Information										
#	Disclosure	Category	Level	Pattern	Disclosure Found	Disclosure Consistent	Applicable	Representation Concept [TEXT BLOCK]		Representation Concept DETAIL
⊟	6 Liabilities and Equity ...	Unknown	Level4Detail	RollUp	True	CONSISTENT	True	NOT-EXPECTED		Liabilities and Equity

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

This is the rendering of this fact set:

Reporting Entity [Axis]	GH259400TOMPUOLS65II http://standards.iso.org/iso/17442	
Reporting Scenario [Axis]	Actual [Member]	
Legal Entity [Axis]	Consolidated Entity [Member]	
Unit [Axis]	USD	
	Period [Axis] ▼	
Statement of Financial Position, Classified [Line Items]	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 Equity, Total	12,000	10,000

(5) Common Stock, by Class [Set]

A set of disclosure mechanics rules are provided for the common stock by class fact set. The report is consistent with those disclosure mechanics rules.

This is the rendering of this fact set:

		2020-12-31			2019-12-31		
Common Stock, by Class [Line Ite...	Unit [Axis]	Class A Common Stock [Member]	Class B Common Stock [Member]	All Classes of Common Stock [Member]	Class A Common Stock [Member]	Class B Common Stock [Member]	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

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(6) Net Income (Loss) [Roll Up]

A set of disclosure mechanics rules are provided for the net income (loss) roll up fact set. The report is consistent with those disclosure mechanics rules.

This is the rendering of this fact set:

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	
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)

(7) Net Cash Flow [Roll Up]

A set of disclosure mechanics rules are provided for the net cash flow roll up fact set. The report is consistent with those disclosure mechanics rules.

This is the rendering of this fact set:

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]	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

(8) Cash and Cash Equivalents [Roll Forward]

A set of disclosure mechanics rules are provided for the cash and cash equivalents roll forward fact set. The report is consistent with those disclosure mechanics rules.

This is the rendering of this fact set:

Reporting Entity [Axis]	GH259400TOMPUOLS65II http://standards.iso.org/iso/17442	
Reporting Scenario [Axis]	Actual [Member]	
Legal Entity [Axis]	Consolidated Entity [Member]	
Unit [Axis]	USD	
	Period [Axis] ▼	
Cash Flow Statement, Direct Method [Line Items]	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

(9) Property, Plant, and Equipment [Roll Up]

A set of disclosure mechanics rules are provided for the property, plant, and equipment roll up fact set. The report is consistent with those disclosure mechanics rules.

This is the rendering of this fact set:

Reporting Entity [Axis]	GH259400TOMPUOLS65II http://standards.iso.org/iso/17442	
Reporting Scenario [Axis]	Actual [Member]	
Legal Entity [Axis]	Consolidated Entity [Member]	
Unit [Axis]	USD	
	Period [Axis] ▼	
Property, Plant and Equipment Components [Line Items]	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

Continuity Cross Checks of Fundamental Accounting Concept Relations

The FASB defines 10 classes of elements of a financial statement: assets, liabilities, equity, comprehensive income, investments by owners, distributions to owners, revenues, expenses, gains, and losses.

Each of these elements is related to other elements in specific way. These three equations explain those relationships:

1. Assets = Liabilities + Equity (i.e. the accounting equation)
2. Comprehensive Income = Revenues - Expenses + Gains – Losses
3. $0 = (Equity^{T0} + Revenue^{P1} - Expenses^{P1} + Gains^{P1} - Losses^{P1} + InvestmentsByOwners^{P1} - DistributionsToOwners^{P1}) + Liabilities^{T1} - Assets^{T1}$

T0 is the beginning balance of balance sheet accounts, P1 is the current period, and T1 is the ending balance of balance sheet accounts.

These fundamental relationships never change. A reporting economic entity might instantiate an item that reports information about the elements, but they (a) cannot change the meaning of the fundamental elements the FASB has defined or (b) contradict the core relationship between the elements.

A set of fundamental accounting concept relations mapped to the elements of a financial statement must not be inconsistent with or contradict these elements and relations.

Entity	Period	ID	Test	Result	Amount...	Evaluation
GH2594...	2020-FY	FAC_CONSISTE...	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]])
GH2594...	2020-FY	FAC_CONSISTE...	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]])
GH2594...	2020-FY	FAC_CONSISTE...	fac:NetIncomeLoss = (fac:IncomeLossFromContinuingOperationsAfterTax + fac:IncomeLossFromDiscontinuedOperationsNetOfTax)	True	0	fac:NetIncomeLoss[frf-sme:NetIncomeLoss[500]] = (fac:IncomeLossFromContinuingOperationsAfterTax[500]] + fac:IncomeLossFromDiscontinuedOperationsNetOfTax[frf-sme:IncomeLossFromDiscontinuedOperations[0]])
GH2594...	2020-FY	FAC_CONSISTE...	fac:NetIncomeLoss = (fac:NetIncomeLossAttributableToParent + fac:NetIncomeLossAttributableToNoncontrollingInterest)	True	0	fac:NetIncomeLoss[frf-sme:NetIncomeLoss[500]] = (fac:NetIncomeLossAttributableToParent[500] + fac:NetIncomeLossAttributableToNoncontrollingInterest[0])
GH2594...	2020-FY	FAC_CONSISTE...	fac:Assets = fac:LiabilitiesAndEquity	True	0	fac:Assets[frf-sme:Assets[12,000]] = fac:LiabilitiesAndEquity[frf-sme:LiabilitiesAndEquity[12,000]]
GH2594...	2020-FY	FAC_CONSISTE...	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)]])
GH2594...	2020-FY	FAC_CONSISTE...	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]])
GH2594...	2020-FY	FAC_CONSISTE...	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]])
GH2594...	2020-FY	FAC_CONSISTE...	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]])
GH2594...	2020-FY	FAC_CONSISTE...	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]])
GH2594...	2020-FY	FAC_CONSISTE...	fac:NetCashFlowDiscontinued = (fac:NetCashFlowFromOperatingActivitiesDiscontinued + fac:NetCashFlowFromInvestingActivitiesDiscontinued + fac:NetCashFlowFromFinancingActivitiesDiscontinued)	True	0	fac:NetCashFlowDiscontinued[0] = (fac:NetCashFlowFromOperatingActivitiesDiscontinued[0] + fac:NetCashFlowFromInvestingActivitiesDiscontinued[0] + fac:NetCashFlowFromFinancingActivitiesDiscontinued[0])