Roll Forward Logic

The following is a summary of logic related to a roll forward[1]. A roll forward relates to how the primary items within a set of [Line Items] is organized and characterized. A roll forward may be further distinguished by dimensions.

Examples

XBRL Cloud: https://xbrlsite.azurewebsites.net/2019/Prototype/conformance-suite/Production/1000-ConceptArangementPatterns/03-RollForward/evidence-package/

Luca Suite: https://luca.pacioli.ai/luca/view/9175b4014583e9fb8113bc253bf24aa764caa86880eec558111ca1cb0f8b1f67ae7a16cb/index
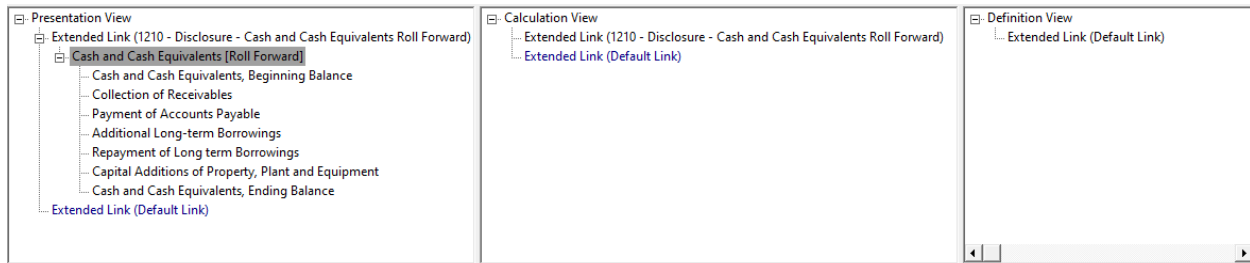
Test case: http://xbrlsite.com/seattlemethod/platinum-testcases/23-TestCase-rollforward.xml

Pesseract:

The following is an example of a modeling of a roll forward logical pattern using XBRL:

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[1] Roll forward, http://www.xbrlsite.com/site1/seattlemethod/platinum-testcases/rollforward/

Brief Description

A **roll forward** concept arrangement pattern reconciles the balance of a concept between two points in time. This concept arrangement pattern is commonly referred to as a "roll forward" or "movement analysis" or "reconciliation" or the equation:

beginning balance + additions – subtractions = ending balance.

In this equation the Period [Axis] is as of two different points in time (instants) and the changes (additions/subtractions) occur during the period between those two points in time (duration).

A roll forward can be detected because (a) it always has in instant as the first and last concept in the presentation relations, (b) the first instant has a periodStart preferred label role, (c) the second instant concept is the same as the first and has the periodEnd preferred label role, and (d) XBRL Formulas exist the represent the roll forward mathematical relation.

[CSH: Note that while an XBRL formula SHOULD be provided, it is commonly NOT PROVIDED because regulators do now allow the XBRL formula linkbase to be used when submitting XBRL-based reports.]

Another form of expressing the relationship is: Instant^{T1} = Instant^{T0} + Changes^{P1} where T0 is the balance at time 0, P1 are changes during some period, and T1 is the balance at time 1.

Another way to understand the roll forward is to use the notion of stocks and flows[2]. Stocks are accumulations. Flows change the accumulation.

Axioms

1. A roll forward is a type of information block object.
2. A roll forward is a reconciliation (durations) between two points in time (instants)..
3. The pseudo mathematical formula is: Ending Balance = Beginning Balance + Changes where there can be any number of changes.
4. The data type of each concept MUST be the same. [CSH: I am pretty sure this is correct; but sometimes a modeling error where the wrong data type is used could cause issues.]
5. The units of each fact in a roll forward must be the same.
6. A roll forward NEVER has two beginning concepts, two ending concepts, no beginning concept, no ending concept, or no changes concept.
7. A roll forward is modeled using XBRL:
   a. Presentation relations show an [Abstract] element which has the Concepts being rolled forward as the children of that one [Abstract] element. The beginning instant concept is always the first concept in the hierarchy and the last instant concept is the last concept in the hierarchy of the root [Abstract] concept.
   b. Calculation relations never exist, by definition, with this specific style of a roll forward as there is no total provided for the sum of the changes in the roll forward.
   c. Definition relations exist only when a hypercube is explicitly provided and are represented using the rules of XBRL Dimensions.
   d. XBRL formula is provided which documents the mathematical relations of the roll forward is best/good practice. (However, roll forwards exist in substandard reports that to not provide the XBRL formula to document the roll forward mathematical relations but sometimes can be derived from the provided model.)
8. A roll forward MAY have ZERO to MANY roll ups nested within the roll forward.
9. If there is no beginning or ending instant concept for a roll forward but there are concepts that do represent changes in the instants; the information is a partial set of information and should not be rendered as part of a roll forward block of information.

Note that a roll forward info, a forthcoming logical information pattern, is not the same as a roll forward.

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[2] Stocks and Flows, https://www.youtube.com/watch?v=nRlYGDBGcRA

Roll forward with a roll up nested within the roll forward:

Component: (Network and Table)	
Network	**Roll Forward of Land**
Table	Land Changes [Table]

Reporting Entity [Axis]	SAMP http://www.SampleCompany.com
Legal Entity [Axis]	Consolidated Entity [Member]
Unit [Axis]	USD

Land Changes [Line Items]	Period [Axis]	
	2010-01-01/2010-12-31	2009-01-01/2009-12-31
Roll Forward of Land [Roll Forward]		
Land, Beginning Balance	1,147,000	1,147,000
Land, Period Increase (Decrease), Total [Roll Up]		
Land, Additions	1,992,000	400,000
Land, Disposals	(193,000)	(200,000)
Land, Translation Difference	2,401,000	(200,000)
Land, Period Increase (Decrease), Total	4,200,000	0
Land, Ending Balance	5,347,000	1,147,000

Note the line item "Land, Period Increase (decrease), Total" which is a roll up of the three change line items of the Land roll forward.

Note that a common roll forward with such a total for the changes is the statement of cash flows which reports the total changes in cash and cash equivalents.

Roll forward distinguished using dimensions:

	Period [Aspect]								
	2022-01-01 | 2022-12-31								
	Class [Dimension]								
Concept [Aspect]	Freehold Land [Member]	Buildings [Member]	Plant and Machinery [Member]	Furniture and Fittings [Member]	Office Equipment [Member]	Tangible Exploration and Evaluation Assets [Member]	Construction in Progress [Member]	Other Miscellaneous Property, Plant and Equipment [Member]	All Classes [Member]
Property, Plant, and Equipment [Roll Forward]									
Property, Plant and Equipment, Net, Beginning Balance	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0
Additions to Property, Plant and Equipment	0	0	0	0	0	0	0	0	0
(Classified as Held for Sale Property, Plant, and Equipment)	0	0	0	0	0	0	0	0	0
Acquisitions of Property, Plant, and Equipment Through Business Combinations	0	0	0	0	0	0	0	0	0
(Revaluations from Imparment Losses Recognized Reversed in Other Comprehensive Income)	0	0	0	0	0	0	0	0	0
(Transfers to from Investment Property)	0	0	0	0	0	0	0	0	0
(Impairment Losses Recognized Reversed in Profit or Loss)	0	0	0	0	0	0	0	0	0
(Depreciation of Property, Plant, and Equipment)	0	0	0	0	0	0	0	0	0
Other Miscellaneous Increases (Decreases) in Property, Plant and Equipment	0	0	0	0	0	0	0	0	0
Property, Plant and Equipment, Net, Ending Balance	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0

Roll forward rendered with period aspect in the rows:

Concept [Aspect]	Period [Aspect]			
Cash and Cash Equivalents [Roll Forward]				
Cash and Cash Equivalents, Beginning Balance	2019-12-31	$ 398,937.76	2018-12-31	$ 398,937.76
Collection of Receivables	2020-01-01 | 2020-12-31	2,072,035.32	2019-01-01 | 2019-12-31	0.00
Payment of Accounts Payable	2020-01-01 | 2020-12-31	(3,096,588.38)	2019-01-01 | 2019-12-31	0.00
Additional Long-term Borrowings	2020-01-01 | 2020-12-31	10,554.36	2019-01-01 | 2019-12-31	0.00
Repayment of Long term Borrowings	2020-01-01 | 2020-12-31	(33,491.00)	2019-01-01 | 2019-12-31	0.00
Capital Additions of Property, Plant and Equipment	2020-01-01 | 2020-12-31	0.00	2019-01-01 | 2019-12-31	0.00
Cash and Cash Equivalents, Ending Balance	2020-12-31	$ (648,551.94)	2019-12-31	$ 398,937.76