1. Introduction to Conceptual Model of a Digital Financial Report

Frameworks[1] help communication and understanding.

What are conspicuously missing from the minds of most professional accountants are a framework and a theory relating to how to think about digital financial reports. This section provides and explains that framework and theory. It provides a high-level overview of the conceptual model of an XBRL-based digital financial report.

1.1. Financial Report Semantics and Dynamics Theory

A **theory** describes absolutes. Theories are the real thing. A theory describes the object of its focus. A theory does not simplify. Theories are irreducible, the foundation on which new metaphors can be built. A successful theory can become a fact. A theory describes the world and tries to describe the principles by which the world operates. A theory can be right or wrong, but it is characteristic by its intent: the discovery of essence.

The *Financial Report Semantics and Dynamics Theory*[2] provides a formal set of self-evident logical principles that no one would argue with (axioms) and deductions which can be proven by constructing a chain of reasoning by applying axioms (theorems) and then provides verification that these axioms and theorems hold up against a set of 8,098 XBRL-based public company financial reports submitted to the Securities and Exchange Commission which show that these self-evident logical principles and deductions are true about financial reports.

Axioms and theorems assert knowledge. Constraints are restrictions on existing knowledge. Constraints can be used to detect incomplete information. Constraints can be used to check knowledge for inconsistencies and contradictions.

The theory provides additional information such as an ethics or worldview of a financial report which helps tie other important information together.

The theory also explains the dynamics or "mechanics" or the mechanical nature of a financial report. While the information expressed by a financial report is far from mechanical, the mechanism by which the information is expressed, be that using printed paper or some digital technology, is in fact mechanical.

To obtain a thorough understanding of the theory you are encouraged to read through the entire *Financial Report Semantics and Dynamics Theory*.

The remainder of this section articulates information from that theory which helps to understand the pieces of a financial report and how the pieces interact with one another. This section uses broad brush strokes to paint the high-level big picture. Subsequent sections dive into the details.

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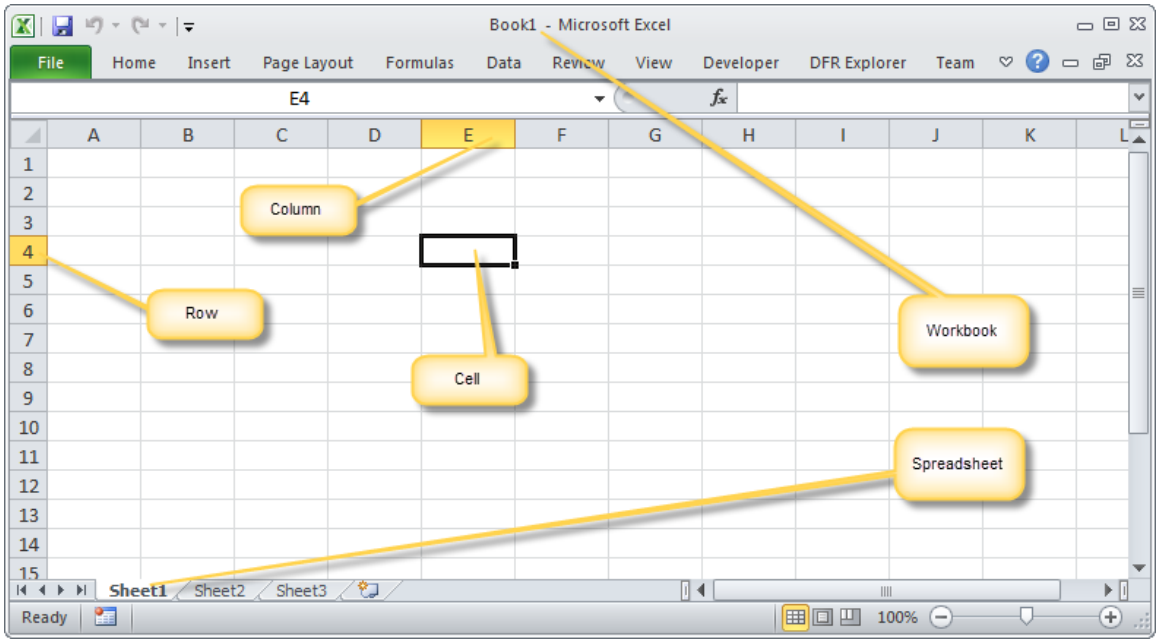
[1] *Understanding the Need for a Framework and Theory*, http://xbrl.squarespace.com/journal/2015/9/20/understanding-the-need-for-a-framework-and-theory.html

[2] Charles Hoffman and Rene van Egmond, *Financial Report Semantics and Dynamics Theory*, http://xbrl.squarespace.com/fin-report-sem-dyn-theory/

First we define the pieces of a financial report and relations between the pieces. We will then provide a narrative which helps the reader better comprehend those pieces and relations.

1.2. Understanding that conceptual models help understanding

Conceptual models help communication and understanding. Every professional accountant understands the electronic spreadsheet which has a high-level conceptual model: workbooks, spreadsheets, rows, columns, and cells:



Just like the workbooks, spreadsheets, columns, rows, and cells of a spreadsheet help you understand, describe, and related to electronic spreadsheets; the multidimensional conceptual model helps you relate to XBRL-based digital financial reports conceptual model.

1.3. Digital financial reports follow the multidimensional model[3]

Professional accountants work with multidimensional information every day and generally don't realize that fact. In fact, many things are inherently multidimensional. Information reported in a financial report is absolutely multidimensional.

You might be familiar with the term multidimensional from business intelligence (BI) software. BI terms tend to represent the technical artifacts that are used to represent real world business phenomenon. Our terms describe the business phenomenon themselves, not a technical implementation. Further, BI dimensional model which is based on online analytical processing (OLAP) works slightly differently than our model which describes how the real world works. For example, in the real world there are numbers, text, and prose; but OLAP is focused only on numbers. In the real world, financial reports provide facts that represent totals; but in OLAP totals

[3] YouTube, *Introduction to the Multidimensional Model for Professional Accountants*, https://www.youtube.com/watch?v=A5AAruLUud4

are calculated on the fly. Our model describes the real world. BI describes an implementation. Further, BI is non-standard so every implementation can use different terms and our model is based on XBRL, a global standard.

1.4. Multidimensional model terminology primer

A **scalar** is a fact which has no distinguishing characteristics; a scalar stands on its own needing no dimensional information to be understood.

Fact Value
3.14

For example, the value of pi is a scalar, it never changes; it always has the same value for everyone. (Pi or π is the ratio of a circle's circumference to its diameter and always has the value of equal to 3.14).

A **fact** defines a single, observable, reportable piece of information contained within a financial report, or fact value, contextualized for unambiguous interpretation or analysis by one or more distinguishing characteristics. Facts can be numbers, text, or prose.

Fact Value
2000
1000

For example, the two facts above with the values of "2000" and "1000".

However, the two facts above are not contextualized; you really have no idea what the numbers mean. To understand the facts, you need context.

A **characteristic** describes a fact (a characteristic is a property of a fact). A characteristic provides information necessary to describe a fact and distinguish one fact from another fact. A fact may have one or many distinguishing characteristics. Characteristics provide context.

Concept	Value
Revenues	2000
Net income	1000

For example, a characteristic of the number "2000" above is that it relates to revenues as opposed to the number "1000" which relates to net income.

Financial facts can have a number of **characteristics**.

Reporting entity	Legal entity	Period	Concept	Value
ABC Company	Consolidated entity	Jan 1, 2011 to Dec 31, 2011	Revenues	2000
ABC Company	Consolidated entity	Jan 1, 2011 to Dec 31, 2011	Net income	1000

For example, some common characteristics include the reporting entity, legal entity, period, and concept which describe a reported financial fact.

And so a fact is the **value** and all of the characteristics which describe the value (including the traits which further describe numeric values).

Reporting entity	Legal entity	Period	Concept	Value	Units	Rounding
ABC Company	Consolidated entity	Jan 1, 2011 to Dec 31, 2011	Revenues	2000	US Dollars	Thousands of dollars
ABC Company	Consolidated entity	Jan 1, 2011 to Dec 31, 2011	Net income	1000	US Dollars	Thousands of dollars

Above we know that the value "2000" is for the concept "Revenues", for the period "Jan 1, 2011 to Dec 31, 2011", relates to the legal entity "Consolidated entity", of the reporting entity "ABC Company". We also know that the numeric value is expressed in the units US Dollars and are rounded to the nearest thousands of dollars.

Units and rounding are traits that describe the numeric facts. (Some people think that Units and Rounding are characteristics rather than traits.)

A **fact table** is a set of facts which go together for some specific reason. All the facts in a fact table share the same characteristics.

Reporting entity	Legal entity	Geographic area	Period	Concept	Value	Units	Rounding
ABC Company	Consolidated entity	All Geographic Areas Combined	Jan 1, 2011 to Dec 31, 2011	Revenues	2000	US Dollars	Thousands of dollars
ABC Company	Consolidated entity	North America	Jan 1, 2011 to Dec 31, 2011	Revenues	1000	US Dollars	Thousands of dollars
ABC Company	Consolidated entity	South America	Jan 1, 2011 to Dec 31, 2011	Revenues	1000	US Dollars	Thousands of dollars

Above you see a fact table (outlined in green) that contains three facts (each outlined in red). Each of the three facts share the characteristics "Reporting entity", "Legal entity", "Geographic area", "Period" and "Concept".

A **relation** is how one thing in a financial report is or can be related to some other thing in a financial report. These relations are often called business rules. There are three primary types of relations (others can exist).

- **Whole-part**: something composed exactly of their parts and nothing else; the sum of the parts is equal to the whole (roll up).
- **Is-a**: descriptive and differentiates one type or class of thing from some different type or class of thing; but the things do not add up to a whole.
- **Computational business rule**: Other types of computational business rules can exist such as "Beginning balance + changes = Ending Balance" (roll forward) or "Originally stated balance + adjustments = Restated balance" (adjustment) or "Net income (loss) / Weighted average shares = Earnings per share"

Reporting entity	Legal entity	Geographic area	Period	Concept	Value	Units	Rounding
ABC Company	Consolidated entity	All Geographic Areas Combined	Jan 1, 2011 to Dec 31, 2011	Revenues	2000	US Dollars	Thousands of dollars
ABC Company	Consolidated entity	North America	Jan 1, 2011 to Dec 31, 2011	Revenues	1000	US Dollars	Thousands of dollars
ABC Company	Consolidated entity	South America	Jan 1, 2011 to Dec 31, 2011	Revenues	1000	US Dollars	Thousands of dollars

So above we know that the value "2000" is for the concept "Revenues", for the period "Jan 1, 2011 to Dec 31, 2011", relates to the legal entity "Consolidated entity", of the reporting entity "ABC Company" and is the total of all "Geographic Areas". "North America" and "South America" are part of the whole "All Geographic Areas Combined".

Grain is the level of depth of information or granularity. The lowest level of granularity is the actual transaction, event, circumstance, or other phenomenon represented in a financial report.

Reporting entity	Legal entity	Geographic area	Period	Concept	Value	Units	Rounding
ABC Company	Consolidated entity	All Geographic Areas Combined	Jan 1, 2011 to Dec 31, 2011	Revenues	2000	US Dollars	Thousands of dollars
ABC Company	Consolidated entity	North America	Jan 1, 2011 to Dec 31, 2011	Revenues	1000	US Dollars	Thousands of dollars
ABC Company	Consolidated entity	South America	Jan 1, 2011 to Dec 31, 2011	Revenues	1000	US Dollars	Thousands of dollars

So above we know that the value "2000" is for the concept "Revenues", for the period "Jan 1, 2011 to Dec 31, 2011", relates to the legal entity "Consolidated entity", of the reporting entity "ABC Company" and is the total of all "Geographic Areas". That describes the first fact (outlined in red) which is one level of granularity. The next two facts (outlined in green) are at a different level of granularity and describe the parts of the geographic areas.

1.5. Understanding difference between a name and a preferred label

A common mistake made by professional accountants creating XBRL-based digital financial reports is to confuse the following three things. It is important to understand the difference/distinction between:

- **Notion, idea, phenomenon**: something that exists in reality.
- **Name**: identifies some notion/idea/phenomenon that exists in reality.
- **Preferred label**: alternative ways used to refer to a name.

1.6. Overview of key terminology of a digital financial report

The following terminology sets a foundation for discussing these principles. These terms explain the framework within which all work to create or review a digital

financial report[4] is performed. This terminology was first introduced by the *Financial Report Semantics and Dynamics Theory*[5] which derived these terms. This terminology is intended to have very precise definitions in order to enable precise communication. The following is a brief summary of these important terms:

- **Report**: Report which communicates financial and nonfinancial information about an economic or accounting entity to users of that report. Financial reports contain facts, characteristics which describe those facts, parenthetical explanations of facts, relations between facts.
- **Component**: A component (or report fragment) is a set of facts which go together (tend to be cohesive and share a certain common nature) for some specific purpose within a financial report. For example, a "balance sheet" is a report component. The "Maturities of long-term debt" disclosure is a report component.
- **Fact**: A fact is reported. A fact defines a single, observable, reportable piece of information contained within a financial report, or fact value, contextualized for unambiguous interpretation or analysis by one or more distinguishing characteristics. A fact value is one property of a fact; every fact has exactly one fact value. The set of characteristics of a fact is a property of the fact. For example, *Cash and cash equivalents* of 100,000 for the *consolidated entity* for the current balance sheet date of *December 31, 2014* which is *reported in US Dollars* is a fact.
- **Characteristic**: A characteristic describes a fact. A characteristic or distinguishing aspect provides information necessary to describe a fact or distinguish one fact from another fact. A fact may have one or many distinguishing characteristics. For example, line item concept *Cash and cash equivalents* is a characteristic and the calendar period *December 31, 2014* are characteristics which describe a fact.
- **Parenthetical explanation**: Facts may have parenthetical explanations which provide additional descriptive information about the fact.
- **Relation**: A relation[6] is some interaction between the pieces which make up a financial report. Report components can be related to other report components. Reported facts can be related to other reported facts. Characteristics can be related to other characteristics. Business rules are a type of relation which describes computation type and logic-based relations. Classes or sets of concepts are relations.
- **Property**: A property is a trait, quality, feature, attribute, or peculiarity which is used to define its possessor and is therefore dependent on the possessor. A property belongs to something. For example, the color of a ball belongs to and is therefore is dependent on (is a property of) the ball. Financial reports have a set of properties. Components have a set of properties. Facts have a

[4] *Digital financial reporting harnesses computers for speed, accuracy*, http://searchfinancialapplications.techtarget.com/opinion/Digital-financial-reporting-harnesses-computers-for-speed-accuracy

[5] See *Financial Report Semantics and Dynamics Theory*: http://xbrl.squarespace.com/fin-report-sem-dyn-theory/

[6] *A Taxonomy of Part-Whole Relations*: http://csjarchive.cogsci.rpi.edu/1987v11/i04/p0417p0444/MAIN.PDF

set of properties. Characteristics have a set of properties. Parenthetical explanations have a set of properties. Relations have a set of properties.

- **Block**: A block[7] is a part of a component that participates in the same concept arrangement pattern. For now, simply think about a block as a useful fragment of a financial report. A Block is a set of facts.
- **Slot**: A slot is simply the idea of an allotted place where something can be logically and sensibly placed in a fragment of a financial report, or Block.
- **Disclosure**: A Disclosure is simply a set of facts that is disclosed.
- **Topic**: A Topic is simply a set of Disclosures that are grouped together for some specific reason.
- **Exemplar**: An Exemplar is an example of a Disclosure from some other existing financial report.
- **Template**: A Template is a starting point or sample used to create a complete Disclosure.

HINT: This video walks you through this foundational terminology: http://www.youtube.com/watch?v=uC-hrpxJ_fA.

1.7. Implementation model

Different software applications may choose to refer to things using different terms. Different XBRL taxonomies may refer to the same thing using different terms. For example, while the XBRL technical syntax uses the term "hypercube", the US GAAP XBRL Taxonomy uses the term "[Table]" to refer to the same construct. Similarly, XBRL uses the term "dimension" and the US GAAP XBRL Taxonomy uses the term "[Axis]".

Further, different syntaxes use different terms. All this can get very confusing. Rather than trying to explain the reasoning and whims which cause these inconsistent terms; just learn these terms because you will see them within digital financial reports:

- **Network**: A Network is a technical artifact that really has no meaning by itself because those creating XBRL-based digital financial reports use networks in different ways.
- **Table**: A Table is the same thing that XBRL calls a hypercube. A Table or hypercube simply groups some set of Axes, Members, Line Items, Abstracts, and Concepts together. Again, because Table's are used inconsistently, they really have no meaning by themselves.
- **Axis**: An Axis is one approach to representing a Characteristic. Entity and period core aspects[8] are also in essence axes.
- **Member**: A Member is a value of a Characteristic.
- **Line Items**: A Line Items is a type of dimension or Axis.

[7] *Understanding Blocks, Slots, Templates and Exemplars*, http://xbrl.squarespace.com/journal/2015/5/11/understanding-blocks-slots-templates-and-exemplars.html

[8] XBRL International, *Open Information Model 1.0*, http://www.xbrl.org/Specification/oim/CR-2017-05-02/oim-CR-2017-05-02.html

- **Abstract**: An Abstract is simply used to organize, they provide no real meaning.
- **Concept**: A Concept is a type of Member. A Concept is special in that it can be used to represent a Fact Value. Therefore, Concepts have data types.

1.7.1.Relations

The implementation model constructs can be related in very specific ways. The following table shows the allowed relationships:

		Parent						
		Network	Table	Axis	Member	LineItems	Abstract	Concept
Child	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	OK
	Concept	Disallowed	Disallowed	Disallowed	Disallowed	OK	OK	Not advised

1.7.2.Relations between concepts or concept arrangement patterns

Within a set of [Line Items], concepts are related to other concepts in specific ways. Concepts can be related to one another numerically. Concepts can be related logically. Concepts can be related mechanically. The following is a summary of concept arrangement patterns:

- **Roll up**: Fact A + Fact B + Fact C = Fact D (a total)
- **Roll forward**: Beginning balance + changes = Ending balance
- **Adjustment**: Originally stated balance + adjustments = restated balance
- **Variance**: Actual amount – Budgeted amount = variance
- **Complex computation**: Net income / Weighted average shares = earnings per share
- **Hierarchy**: Facts are related in some way, but not numerically.

Subsequent sections provide a more detailed explanation of concept arrangement patterns and examples of such patterns.

1.7.3.Relations between members or member arrangement patterns

Within an [Axis], the [Member]s of that [Axis] are arranged in specific ways which is called the Member Arrangement Pattern. Member Arrangement Patterns fall into two broad groups:

- **Whole-part**: something composed exactly of their parts and nothing else; the sum of the parts is equal to the whole. Essentially, a whole-part relation is equivalent to a [Roll Up].
- **Is-a**: descriptive and differentiates one type or class of thing from some different type or class of thing; but the things do not add up to a whole.

Subsequent sections provide a more detailed explanation of member arrangement patterns and examples of such patterns.

1.7.4.Mechanical and logical relations

In addition to numeric relations, there can exist other types of mechanical and logical relations. For example:

- Something can be equivalent to something else. For example, a concept can be identified as being equivalent to another concept.
- Something can be identified as something specific. For example, a concept can be identified as being of a certain type or belonging to a specific class.
- Something specific can be broken down into more general. For example, a part of "Cash and cash equivalents" can be broken down into "Petty cash".
- A Block can be identified as being of a specific concept arrangement pattern and/or member arrangement pattern.
- A specified report element could be required.

All of these sorts of relationships can be described in machine readable form and then leveraged by a software creation in the process of creating or using a digital financial report.

1.7.5.Advanced relationships

The following is advanced information relating to relationships.

Characteristics can represent a whole or some part of a whole[9]. Parts may be related to wholes in different ways. The following is a summary of subclasses of whole-part types of relations which may, or may not, be applicable to financial reporting. They are simply provided as an example. Other subclasses of whole-part relations may exist.

- **Component-integral object**: Indicates that a component contains some integral object. For example, the component handle is part of the integral object cup; wheels are a component part of a car; a refrigerator is a component of a kitchen.
- **Member-collection**: Indicates that some member is part of some collection. For example a ship is part of a fleet. Or, a subsidiary is part of an economic entity.
- **Portion-mass**: Indicates that some portion is part of some mass. For example a slice is part of a pie.
- **Stuff-object**: Indicates that some "stuff" is part of some object. For example steel is part of a car.
- **Feature-activity**: Indicates that some feature is part of some activity. For example the feature "paying" is part of the activity "shopping".
- **Place-area**: Indicates that some physical place is part of some area. For example the place "Everglades" is part of the area "Florida".

[9] *Toward Understanding Whole-Part Relations*, http://xbrl.squarespace.com/journal/2015/1/20/toward-understanding-whole-part-relations.html

The above are general types of whole-part types of relations. There are likely financial reporting specific types of whole-part relations. Not all of the general whole-part relations are applicable to financial reporting.

Whole-part relations may involve numerical computations.

For example, the business segments of a reporting entity along with any consolidation eliminations can be identified, articulated, and aggregated to the consolidated entity.

The spectrum of relations between characteristics is:

- **Partial set**: A partial sets are [Member]s of an [Axis] which do not comprise the full spectrum or universe of possible options. For example, "United States" and "Spain" is a partial set of countries.
- **Complete flat set**: A complete flat set is a "flat" (meaning no sub-relations) and complete list of [Member]s of an [Axis]. For example, a listing of all the business segments could be a complete flat set if it is (a) complete and (b) it is one flat list with no sub relations.
- **Complete hierarchical set**: A complete hierarchical set is like a complete flat set in that it is complete; however a complete hierarchical set does have sub relations making it hierarchical as compared to flat. For example, a list of the countries which make up the geographic areas of a reporting entity which is further grouped by regions into which each country fits is a complete hierarchical set.
- **Complete complex set**: A complete complex set is like a complete flat and complete hierarchical set in that it is complete; however the hierarchy of relations is not flat nor a simple hierarchy but rather the hierarchy is complex, perhaps containing multiple hierarchies.

NOTE: Note that sets which are complete can be aggregated. A member aggregation is similar to a roll up in that it is an aggregation; however the aggregation is not across a set of [Line Items], rather there is only one [Line Items] concept which is used by multiple facts, the aggregation is of the [Member]s which differentiate that single concept. The formula for a member aggregation is: Concept(Member 1) + Concept(Member 2) + Concept(Member N) = Concept(Default Member). The default member is generally intersected with some other financial report component. (Note that semantically, a member aggregation and a roll up are identical. Syntactically, a roll up is expressed using XBRL calculations and a member aggregation must be expressed using XBRL Formula.)

1.7.6.Relations between report fragments

A financial report has a flow, or an ordering or sequencing of the report fragments which make up the financial report. Financial report creators have flexibility as to this flow, for example an income statement could come before or after a balance sheet.

- **Report fragment**: Any specific part of a digital financial report.
- **Component**: Defined as a Network plus a Table

- **Block**: A set of [Line Items] that have the same Concept Arrangement Pattern.
- **Information model**: The Member Arrangement Pattern and Concept Arrangement Pattern of a Block.

1.8. Understanding the notion of a block and a slot

Think of a financial report not as one big thing, but rather as thousands of much smaller pieces[10]. Reports can be broken down into pieces or report fragments, or I call them **components**. A component is simply a set of reported facts that tend to be cohesive and share a certain common nature and therefore go together.

A component maps to an XBRL network plus an XBRL hypercube (as called by XBRL Dimensions) or [Table] (as called by the US GAAP XBRL Taxonomy).

I just made up the term component. The term "report fragment" could do. By giving each type of piece a name, the pieces can be referred to. The different types of pieces are related to other types of pieces in clear, consistent, logically coherent, and unambiguous ways[11].

Another term that I made up is the term "block". Imagine the lowest common component that is used to work with some set of information reported in a digital financial report. I call that structure a "block"[12].

A **block** is a part of a component that participates in the same *concept arrangement pattern*[13]. A roll up, roll forward, adjustment, and hierarchy are all types of concept arrangement patterns. Every XBRL-based public company financial report is essentially a set of blocks. I estimate that there are about 754,430 blocks in the set of public company reports that I analyzed. 16% are roll ups, 5% are roll forwards, 24% are hierarchies, and 54% are text blocks[14].

Concept arrangement patterns are the relations between concepts that exist in a block: The concepts which make up a set of [Line Items] (primary items) are related to other concepts in specific ways.

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[10] See Analysis of 6,751 XBRL-based Public Company 10-Ks Submitted to SEC, http://www.xbrlsite.com/DigitalFinancialReporting/Book2015/DigitalFinancialReporting-2015-04-29-C28.pdf

[11] See *Understanding Basic Mechanics of a Digital Financial Report*, http://www.xbrlsite.com/DigitalFinancialReporting/Book2015/DigitalFinancialReporting-2015-04-29-C05.pdf

[12] See Section 5.7 Notion of Block, http://www.xbrlsite.com/DigitalFinancialReporting/Book2015/DigitalFinancialReporting-2015-04-29-C05.pdf#page=5

[13] See page 11, http://www.xbrlsite.com/2015/Analysis/AnalysisSummary2014_PiecesOfReoprt.pdf#page=11

[14] I have a document that summarizes this information.

Member arrangement patterns are the relations between the [Member]s of an [Axis]: The [Member]s of an [Axis] are related in specific ways, those ways are called member arrangement patterns. There are three broad groups of member arrangement patterns: Whole-Part, Is-A, and specific types of mathematical computations.

An **information model** is the combined *concept arrangement pattern* and *member arrangement pattern* of a block.

The **flow model** is the sequence or arrangement of blocks within a component and components within a report.

Blocks have something called a "slot"[15]. A **slot** is simply the idea of an allotted place where something can be logically and sensibly placed in a block. For example, a roll up has exactly *one* total and so *two* totals could never logically be added to a roll up.

Blocks and slots are in no way random. Blocks are used to represent information that is disclosed in a financial report in consistent ways, patterns. Balance sheets and the other primary financial statements are made up of blocks, long-term debt maturities disclosure and other disclosures are made up of blocks. Every fragment of a financial report is a set of one or many blocks. As I pointed out, blocks have very specific concept arrangement patterns: roll up, roll forward, text block, adjustment, hierarchy (set). Blocks are related to other blocks in very specific ways.

1.8.1.Basic block

Here is an example of a block that represents a roll up (the concept arrangement pattern) which has no [Axis] and therefore the most basic member arrangement pattern:

Property, Plant and Equipment, by Component [Line Items]	Period [Axis]	
	2010-12-31	2009-12-31
Property, Plant and Equipment, by Component [Roll Up]		
Land	1,000,000	1,000,000
Machinery and equipment, gross	2,000,000	2,000,000
Furniture and fixtures, gross	6,000,000	6,000,000
Accumulated depreciation	(1,000,000)	(1,000,000)
Property, plant and equipment, net	8,000,000	8,000,000

You cannot add a second total to a roll up as a roll up has only one total. It would not make logical sense to add a second total to a roll up. Therefore, adding second totals to a roll up should be disallowed within a software application.

[15] See section 5.5. Understanding the notion of slot or opening, http://www.xbrlsite.com/DigitalFinancialReporting/Book2015/DigitalFinancialReporting-2015-04-29-C05.pdf#page=3

It does make sense to add another concept to the set of line items which aggregate to the total. It also does make sense to add an entirely new period characteristic. A slot is simply a logical location where something can be added to a block. Exactly where slots exist in a block depends on the *concept arrangement pattern* and *member arrangement pattern* of the block. Every block in every report fragment or component works in exactly this same way.

If you are a professional accountant you innately understand how information is related in a set of information such as what is represented in the example shown above. And there are many, many other such report fragments within a financial report. But professional accountants don't call these pieces of information "blocks" because they never needed to explain the mechanics and dynamics that are at work to a computer before. But to represent a financial report digitally and to interact with software applications that provide these digital representations of a financial report describing these mechanics and dynamics is necessary.

1.8.2.Slightly more complex block

Below is a slightly more complex block. The block below is made up of two roll ups and has a whole-part relation which semantically is really similar to a roll up. Professional accountants understand that the disclosure below both "foots" and "cross casts". However, the software vendor creating this application does not provide the single underscores and double underscores that explicitly show the mathematical relations. I have added green arrows to show the mathematical relations and green check marks to show that all the information does in fact foot and cross cast as expected:

	0000000001			
	31-Dec-2011			
	All Available-for-Sale Debt and Equity Securities [Domain]	Treasury bills [Member]	Corporate bonds [Member]	Sovereign debt securities [Member]
Available-for-sale Securities, Contractual Maturities [Table]				
Available-for-sale Securities, Contractual Maturities [Line Items]				
Available-for-sale securities at amortized cost [Roll Up]				
Due in one year or less	$300,000,000	$100,000,000	$100,000,000	$100,000,000
Due after one year through five years	$300,000,000	$100,000,000	$100,000,000	$100,000,000
Due after five years through ten years	$300,000,000	$100,000,000	$100,000,000	$100,000,000
Due after ten years	$300,000,000	$100,000,000	$100,000,000	$100,000,000
No contractual maturity dates	$300,000,000	$100,000,000	$100,000,000	$100,000,000
Available-for-sale securities at amortized cost	$1,500,000,000	$500,000,000	$500,000,000	$500,000,000
Available-for-sale securities at estimated fair value [Roll Up]				
Due in one year or less	$300,000,000	$100,000,000	$100,000,000	$100,000,000
Due after one year through five years	$300,000,000	$100,000,000	$100,000,000	$100,000,000
Due after five years through ten years	$300,000,000	$100,000,000	$100,000,000	$100,000,000
Due after ten years	$300,000,000	$100,000,000	$100,000,000	$100,000,000
No contractual maturity dates	$300,000,000	$100,000,000	$100,000,000	$100,000,000
Available-for-sale securities at estimated fair value	$1,500,000,000	$500,000,000	$500,000,000	$500,000,000

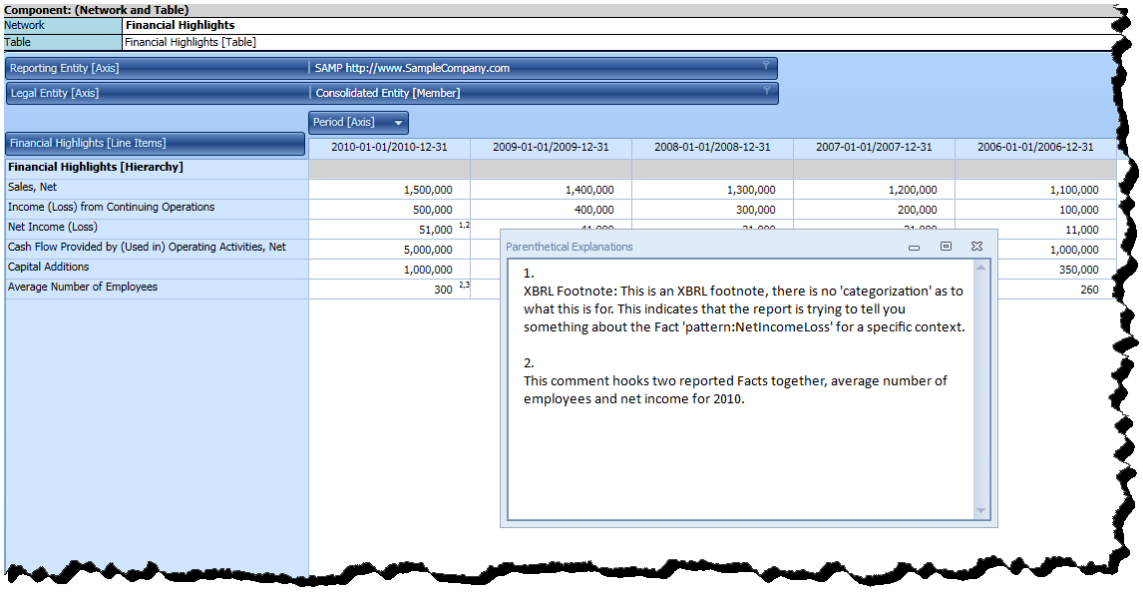
The block above has two blocks. Each block has a roll up concept arrangement pattern. Each block shares the same member arrangement pattern which happens to be a whole-part relation. Semantically, the whole-part member arrangement pattern relation is identical to the roll up concept arrangement pattern. It still makes

sense to add concepts to the roll up. It still makes sense to add a new period. It also makes sense to add an additional [Member] to the [Axis]. (NOTE that this software does not show the name of the [Axis] "Period" or the other [Axis] which contains the [Member]s shown above.)

Imagine articulating all the things that are going on unconsciously in the mind of a professional accountant to a machine such as a computer in a manner that is explicitly understandable to the computer. That is why we are providing explicit names such as "block" and "slot" and "concept arrangement pattern" and "member arrangement pattern".

1.9. Understanding the notion of a parenthetical explanation

A parenthetical explanation is a comment that can be attached to any fact. A parenthetical explanation provides additional descriptive information for a fact. Below you see the line item "Net Income (Loss)" which has two parenthetical explanations.



1.10. Understand specific risks and automated versus manual risk mitigation verification tasks

While the previous section discusses general risks that things are incorrect, incomplete, inaccurate, or don't fit together properly; this section points out specifics. Below is a summary of specific things that can go wrong, whether the fact that it is wrong can be detected using automated processes or whether manual processes must be used, and measurements from 2015, 2014, 2013, and 2012 where measurements are available: (automated tests only)

#	Goal or Desired State of Digital Financial Report	Automatable	Manual	FY 2015	FY 2014	FY 2013	FY 2012
1	**XBRL syntax**: XBRL technical syntax consistent with XBRL technical specification requirements	X		99.9%	99.9%	99.9%	99.9%
2	**EFM**: Consistent with requirements of EDGAR Filer automated and manual (EFM) syntax/semantics rules	X	X	Unknown	81.9%	Unknown	80.5%
3	**Model structure**: Consistent and unambiguous report level representation or model structure	X		99.9%	99.9%	99.9%	97.9%
4	**Root economic entity discovery**: Root entity of focus (economic entity, accounting entity) successfully and unambiguously detectable	X		99.7%	99.5%	99.2%	98.8%
5	**Key dates**: Current balance sheet date (document period end date) and income statement period (period context of document period end date) successfully and unambiguously detected	X		99.5%	99.3%	98.6%	Unknown
6	**FAC relations**: Fundamental accounting concept skeleton successfully and unambiguously detected and relations between concepts consistent	X		98.8%	98.7%	97.8%	97.9%
7	**Statement roll ups**: Primary financial statement roll up computations (balance sheet, income statement, statement of comprehensive income, cash flow statement) detected, intact, and foot	X		97.3%	92.0%	90.1%	84.9%
8	**Statement discovery**: Primary financial statements successfully discovered	X	X	97.3%	88.7%	87.8%	Generally successful
9	**Statement computations**: Primary financial statements foot and roll forward (cash flow statement, statement of changes in equity) appropriately	X		Unknown	92.0%	90.5%	84.9%
10	**Level 1 notes**: Level 1 footnote disclosures appropriate	X	X	Unknown	Unknown	Unknown	Unknown
11	**Industry specific**: Industry specific accounting concepts and relations valid	X	X	Unknown	Unknown	Unknown	Unknown
12	**Level 2 policies**: Level 2 policy text block disclosures appropriate		X	Fair	Fair	Fair	Unknown
13	**Level 3 Text Block disclosures**: Each Level 3 [Text Block] and related Level 4 detail disclosure match appropriately	X	X	Poor	Poor	Poor	Poor
14	**Level 4 detailed disclosures**: Each Level 4 detail disclosure valid including representation structure, mathematical computations, intersections with other components, etc.	X	X	Unknown	Unknown	Unknown	Unknown
15	**Required disclosures**: Required disclosures discovered	X		Unknown	Unknown	Unknown	Unknown
16	**Consistency with prior period**: Reported prior period information consistent with prior report current period information where appropriate	X	X	Unknown	Unknown	Unknown	Unknown
17	**Consistency of disclosures**: Disclosure rules have been met and make sense	X	X	Unknown	Unknown	Unknown	Unknown
18	**Concept selection appropriateness**: Report element selection is justifiable, defensible, and otherwise appropriate		X	Unknown	Unknown	Unknown	Unknown
19	**Reported facts full/false inclusion**: Reported facts appropriate		X	Unknown	Unknown	Unknown	Unknown
20	**Consistency of facts with peers**: Variance analysis of reported facts as compared to peer or peer group appropriately explainable	X	X	Unknown	Unknown	Unknown	Unknown

21	**Concept selection consistent with peers**: Report element selection is consistent with peers or peer groups as appropriate		X	Unknown	Unknown	Unknown	Unknown
22	**Disclosure full/false inclusion**: Disclosure checklist review for full inclusion		X	Unknown	Unknown	Unknown	Unknown
23	**True and fair representation**: True and fair representation of financial information of economic entity		X	Unknown	Unknown	Unknown	Unknown

This list is not fully inclusive, but there is nothing on the list that can be excluded from a process of verifying that a digital financial report is correct.

1.11. Example verification dashboard framework

The document *Blueprint for Creating Zero-Defect XBRL-based Digital Financial Reports*[16] provides additional information related to the validation described above and describes the notion of a defect-free XBRL-based digital financial report.

The following is a summary of example dashboards which can be helpful in understanding if an XBRL-based digital financial report is created appropriately.

1.11.1. Verify report

The following is a summary dashboard to verify one report:

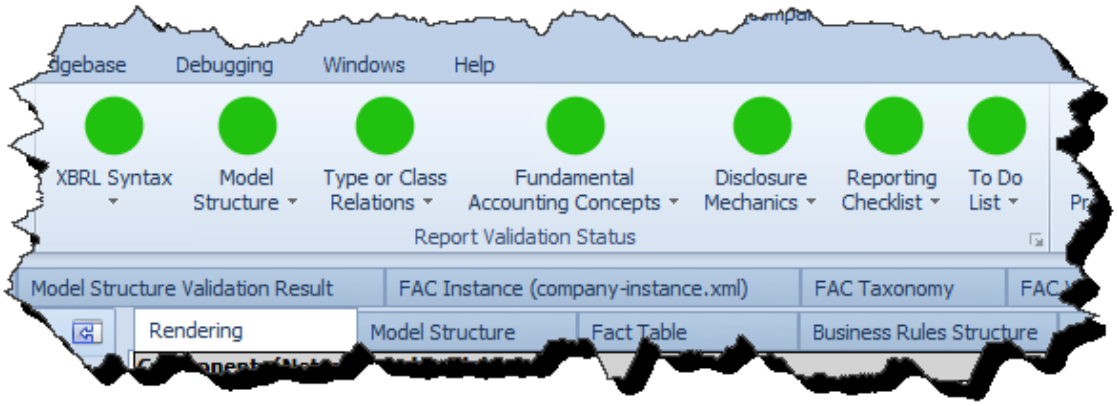
Signals

#	Category	Signal	Severity	Failures	Filings	Pass %	Fail %
1	SCI	usfac:IS9	REVIEW	1	1	0.00%	100.00%

Validations

#	CIK	Accession	Entity Registrant Name	Creation Software	Document Type	Fiscal Year	Fiscal Period	BS	IS	SCI	CF	x-Ambiguous Entity or Period	x-Missing BS, IS, CF Roll Ups	z-Other
1	0000104207	0000104207-13-000141	Walgreen Co	Accelus	10-Q	2013	Q1	0	0	1	0	0	0	0

Here is another dashboard for providing summary information about the consistency of an XBRL-based report to business rules used to verify the quality of that report:



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

The dashboard summarizes detailed information so professional accountants can quickly determine whether errors exist in XBRL-based digital financial reports where automated processes can be used. Below is an example of one section of the detailed report that feeds the summary dashboard:

Income Statement [Line Items]	Period [Axis] 2015-01-01 - 2015-12-31 Fact Value	Origin
Net Income (Loss) [Roll Up]		
Income (Loss) from Continuing Operations After Tax [Roll Up]		
Income (Loss) from Continuing Operations Before Tax [Roll Up]		
Interest Income (Expense), After Provision for Losses [Roll Up]		
Interest Income (Expense), Net [Roll Up]		
Interest and Dividend Income, Operating	40,945,000	fac:InterestAndDividendIncomeOperating[us-gaap:InterestAndDividendIncomeOperating[40,945,000]]
Interest Expense, Operating	4,636,000	fac:InterestExpenseOperating[us-gaap:InterestExpense[4,636,000]]
Interest Income (Expense), Operating, Net	36,309,000	fac:InterestIncomeExpenseOperatingNet[us-gaap:InterestIncomeExpenseNet[36,309,000]]
Provision for Loan, Lease, and Other Losses	1,100,000	fac:ProvisionForLoanLeaseAndOtherLosses[us-gaap:ProvisionForLoanAndLeaseLosses[1,100,000]]
Interest Income (Expense) After Provision for Losses	35,209,000	fac:InterestIncomeExpenseAfterProvisionForLosses[us-gaap:InterestIncomeExpenseAfterProvisionForLoanLoss[35,209,000]]
Noninterest Income	7,272,000	fac:NoninterestIncome[us-gaap:NoninterestIncome[7,272,000]]
Noninterest Expense	29,755,000	fac:NoninterestExpense[us-gaap:NoninterestExpense[29,755,000]]
Income (Loss) from Continuing Operations Before Tax	12,726,000	fac:IncomeLossFromContinuingOperationsBeforeTax[us-gaap:IncomeLossFromContinuingOperationsBeforeIncomeTaxesMinorityInterestAndIncomeLossFromEquityMethodInvestments[12,726,000]]
Income Tax Expense (Benefit)	4,062,000	fac:IncomeTaxExpenseBenefit[us-gaap:IncomeTaxExpenseBenefit[4,062,000]]
Income (Loss) from Continuing Operations After Tax	8,664,000	fac:IncomeLossFromContinuingOperationsAfterTax[8,664,000] = fac:IncomeLossFromContinuingOperationsBeforeTax[us-gaap:IncomeLossFromContinuingOperationsBeforeIncomeTaxesMinorityInterestAndIncomeLossFromEquityMethodInvestments[12,726,000]] - fac:IncomeTaxExpenseBenefit[us-gaap:IncomeTaxExpenseBenefit[4,062,000]]
Income (Loss) from Discontinued Operations, Net of Tax	0	fac:IncomeLossFromDiscontinuedOperationsNetOfTax[0] = 0
Extraordinary Items of Income (Expense), Net of Tax	0	fac:ExtraordinaryItemsOfIncomeExpenseNetOfTax[0] = 0
Net Income (Loss)	8,664,000	fac:NetIncomeLoss[8,664,000] = fac:IncomeLossFromContinuingOperationsAfterTax[8,664,000] + fac:IncomeLossFromDiscontinuedOperationsNetOfTax[0] + fac:ExtraordinaryItemsOfIncomeExpenseNetOfTax[0]

1.11.2. Compare across reports

The following is a summary dashboard to verify across reports to determine if all reports are created correctly:

CIK	Accession	Entity Registrant Name	Creation Software	Document Type	Fiscal Year	Fiscal Period	BS	IS	SCI	CF	x-Ambiguous Entity or Period	x-Missing BS, IS, CF Roll Ups	z-Other
0000766704	0000766704-16-000055	WELLTOWER INC. /DE/	IBM Cognos CDM	10-K	2015	FY	0	0	1	0	0	0	0
0000766704	0000766704-15-000043	WELLTOWER INC. /DE/	IBM Cognos CDM	10-Q	2015	Q3	0	0	0	0	0	0	0
0000766704	0000766704-15-000031	HEALTH CARE REIT INC /DE/	IBM Cognos CDM	10-Q	2015	Q2	0	0	0	0	0	0	0
0000766704	0000766704-15-000021	HEALTH CARE REIT INC /DE/	IBM Cognos CDM	10-Q	2015	Q1	0	0	0	0	0	0	0
0000766704	0000766704-15-000012	HEALTH CARE REIT INC /DE/	IBM Cognos CDM	10-K	2014	Q4	0	0	1	0	0	0	0
0000766704	0000766704-14-000030	HEALTH CARE REIT INC /DE/	IBM Cognos CDM	10-Q	2014	Q3	0	0	0	0	0	0	0
0000766704	0000766704-14-000019	HEALTH CARE REIT INC /DE/	IBM Cognos CDM	10-Q	2014	Q2	0	0	0	0	0	0	0
0000766704	0000766704-14-000012	HEALTH CARE REIT INC /DE/	IBM Cognos CDM	10-Q	2014	Q1	0	0	0	0	0	0	0
0000766704	0000766704-14-000006	HEALTH CARE REIT INC /DE/	IBM Cognos CDM	10-K	2013	Q4	0	0	1	0	0	0	0
0000766704	0000766704-13-000035	HEALTH CARE REIT INC /DE/	IBM Cognos CDM	10-Q	2013	Q3	0	0	0	0	0	0	0
0000766704	0000766704-13-000024	HEALTH CARE REIT INC /DE/	IBM Cognos FSR	10-Q	2013	Q2	0	0	0	0	0	0	0
0000766704	0000766704-13-000015	HEALTH CARE REIT INC /DE/	IBM Cognos FSR	10-Q	2013	Q1	0	0	1	0	0	0	0
0000766704	0000766704-13-000006	HEALTH CARE REIT INC /DE/	IBM Cognos FSR	10-K	2012	Q4	0	0	1	0	0	0	0
0000766704	0000766704-12-000034	HEALTH CARE REIT INC /DE/	IBM Cognos FSR	10-Q	2012	Q3	0	0	0	0	0	0	0
0000766704	0000766704-12-000020	HEALTH CARE REIT INC /DE/	IBM Cognos FSR	10-Q	2012	Q2	1	0	0	0	0	0	0
0000766704	0000766704-12-000009	HEALTH CARE REIT INC /DE/	IBM Cognos FSR	10-Q	2012	Q1	1	0	0	0	0	0	0
0000766704	0000950123-12-002707	HEALTH CARE REIT INC /DE/	IBM Cognos FSR	10-K	2011	Q4	1	0	0	0	0	0	0
0000766704	0001193125-11-294910	HEALTH CARE REIT INC /DE/	RR Donnelley	10-Q	2011	Q3	1	0	0	0	0	0	0
0000766704	0000950123-11-075160	HEALTH CARE REIT INC /DE/	RR Donnelley	10-Q	2011	Q2	1	0	0	0	0	0	0
0000766704	0000950123-11-048445	HEALTH CARE REIT INC /DE/	RR Donnelley	10-Q	2011	Q1	1	0	0	0	0	0	0
0000766704	0000950123-11-028671	HEALTH CARE REIT INC /DE/	RR Donnelley	10-K	2010	FY	1	0	0	0	0	0	0
0000766704	0000950123-10-102561	HEALTH CARE REIT INC /DE/	IBM Cognos FSR	10-Q	2010	Q3	0	0	0	0	0	0	0
0000766704	0000950123-10-074122	HEALTH CARE REIT INC /DE/	IBM Cognos FSR	10-Q	2010	Q2	0	0	0	0	0	0	0

1.11.3. Compare specific detail across periods

The following is an example of comparing details across periods. Here you see high-level items related to the statement of comprehensive income. Each financial report section could have this type of comparison.

Component: (Network and Table)																			
Network	311-Comprehensive Income (Loss) Breakdown (http://www.xbrlsite.com/2014/Prototype/fac/ComprehensiveIncomeBreakdown)																		
Table	Comprehensive Income (Loss) Breakdown [Table] (overriden)																		
	Reporting Entity [Axis]																		
	WELLTOWER INC. (766704)																		
	Fiscal Year [Axis]																		
	2012				2013				2014				2015						
Comprehensive Income (Loss) Breakdown [Line Items]	Fiscal Period [Axis]				Fiscal Period [Axis]				Fiscal Period [Axis]				Fiscal Period [Axis]						
	Q1	Q2	Q3	FY	Q1	Q2	Q3	FY	Q1	Q2	Q3	FY	Q1	Q2	Q3	FY			
Comprehensive Income (Loss) [Roll Up]																			
Comprehensive Income (Loss) Attributable to Parent	56,688,000	134,543,000	191,573,000	293,325,000	49,875,000	41,608,000	104,603,000	105,013,000	65,487,000	160,445,000	278,991,000	430,319,000	176,664,000	531,415,000	717,118,000	810,184,000			
Comprehensive Income (Loss) Attributable to Noncontrolling Interest	-1,056,000	-1,876,000	-2,241,000	-2,415,000	139,000	-5,228,000	-9,109,000	-13,267,000	-9,187,000	-2,910,000	-10,894,000	-14,678,000	-10,285,000	-5,145,000	-19,416,000	-31,166,000			
Comprehensive Income (Loss)	57,744,000	132,667,000	189,332,000	290,740,000	49,736,000	36,380,000	95,494,000	118,280,000	56,300,000	157,535,000	268,097,000	444,997,000	166,379,000	526,270,000	697,702,000	841,350,000			

1.11.4. Compare specific detail across peer entities

The following is an example of comparing details across peer entities. Here you see high-level items related to the statement of comprehensive income. Each financial report section could have this type of comparison.

Component: (Network and Table)								
Network	311-Comprehensive Income (Loss) Breakdown (http://www.xbrlsite.com/2014/Protototype/fac/ComprehensiveIncomeBreakdown)							
Table	Comprehensive Income (Loss) Breakdown [Table] (overriden)							
	Reporting Entity [Axis]							
	ALEXANDRIA REAL ESTATE EQUITIES INC (1035443)	APACHE CORP (6769)	ARCHER DANIELS MIDLAND CO (7084)	Alliance Holdings GP, L.P. (1344980)	BRUKER CORP (1109354)	PILGRIMS PRIDE CORP (802481)	SNYDER'S-LANCE, INC. (57528)	WELLTOWER INC. (766704)
	Fiscal Year [Axis]	Fiscal Year [Axis]	Fiscal Year [Axis]	Fiscal Year [Axis]	Fiscal Year [Axis]	Fiscal Year [Axis]	Fiscal Year [Axis]	Fiscal Year [Axis]
	2015	2015	2015	2015	2015	2015	2015	2015
Comprehensive Income (Loss) Breakdown [Line Items]	Fiscal Period [Axis]	Fiscal Period [Axis]	Fiscal Period [Axis]	Fiscal Period [Axis]	Fiscal Period [Axis]	Fiscal Period [Axis]	Fiscal Period [Axis]	Fiscal Period [Axis]
	FY	FY	FY	FY	FY	FY	FY	FY
Comprehensive Income (Loss) [Roll Up]								
Comprehensive Income (Loss) Attributable to Parent	194,036,000	-23,119,000,000	944,000,000	211,893,000	29,200,000	649,525,000	51,062,000	810,184,000
Comprehensive Income (Loss) Attributable to Noncontrolling Interest	1,893,000	-409,000,000	-4,000,000	93,555,000	2,300,000	48,000	33,000	-31,166,000
Comprehensive Income (Loss)	195,929,000	-23,528,000,000	940,000,000	305,448,000	31,500,000	649,573,000	51,095,000	841,350,000

1.12. Tool for Manual Verification of Digital Financial Reports

The following is a publically available example of one tool that can be used to manually verify an XBRL-based digital financial report:

https://edgardashboard.xbrlcloud.com/edgar-dashboard/static/evidence-package/sample/index.html

1.13. Conceptual Model Narrative

The following narrative of the conceptual model is intended to further drill into the meaning of the parts of a financial report and the relations between the parts of a financial report.

A financial report can be broken down into logical report fragments. Networks, Tables, Components (Network + Table), and Blocks (Network + Table + Concept arrangement pattern) are useful logical structural fragments of a financial report.

A financial report communicates facts. Facts have fact values. Facts are never free-floating within a financial report; facts must existing within a some Network. Therefore, facts also must exist within a Table, Component, and Block.

Here are two facts:

Fact Value
2000
1000

Facts reported in a financial report have characteristics which distinguish one fact from another fact. Characteristics explicitly contextualize facts for unambiguous interpretation or analysis. Here are two facts and their characteristic "Concept" and the values for each Concept characteristic, "Revenues" and "Net income (loss)", which explicitly describe the two facts and distinguish one fact from the other fact:

Concept	Fact Value
Revenues	2000
Net income (loss)	1000

Facts generally have more than one characteristic. XBRL-based financial facts MUST have a minimum of three core characteristics: Reporting entity, Period, and Concept. Those representing financial reports can add their own additional characteristics should they be necessary. Here is a complete set of characteristics which provide further explicit description for these two facts:

Reporting entity	Legal entity	Period	Concept	Fact Value
ABC Company	Consolidated entity	January 1, 2011 to December 31, 2011	Revenues	2000
ABC Company	Consolidated entity	January 1, 2011 to December 31, 2011	Net income (loss)	1000

And so a fact is a single, observable, reportable piece of information contained within a financial report, or fact value, contextualized for unambiguous interpretation or analysis by one or more distinguishing characteristics. A fact is the value plus the characteristics which contextualize the value. A fact may also have zero or many parenthetical explanations (i.e. XBRL footnotes). Above you see two facts.

A set of facts which go together for some specific purpose is called a component. A component is defined as being a Network PLUS a Table. Tables can be explicit or implied. Every network MUST have at least one explicitly defined or implicit table. Financial reports have many components. Below you see a set of facts which go together to make up an income statement component. (Note that only a portion of the complete set of facts which would make up the entire income statement are shown):

Reporting entity	Legal entity	Period	Concept	Fact Value
ABC Company	Consolidated entity	January 1, 2011 to December 31, 2011	Revenues	2000
ABC Company	Consolidated entity	January 1, 2010 to December 31, 2010	Revenues	2500
ABC Company	Consolidated entity	January 1, 2009 to December 31, 2009	Revenues	2300
ABC Company	Consolidated entity	January 1, 2011 to December 31, 2011	Cost of revenues	1800
ABC Company	Consolidated entity	January 1, 2010 to December 31, 2010	Cost of revenues	1700
ABC Company	Consolidated entity	January 1, 2009 to December 31, 2009	Cost of revenues	1600
ABC Company	Consolidated entity	January 1, 2011 to December 31, 2011	Gross profit	200
ABC Company	Consolidated entity	January 1, 2010 to December 31, 2010	Gross profit	800

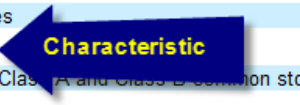
If you look at the set of facts above you note that the facts and their values and characteristics are organized in the form of a matrix or table. A table of facts, or fact table, is easy for a computer to read and understand but harder for a human to read and understand.

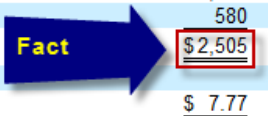
A fact table can also be better organized for human use by creating a rendering. A rendering is simply a fact table reorganized for presentation to a human. For example, below you see a fact table of an income statement which has been reorganized into a rendering:

Google Inc.

CONSOLIDATED STATEMENTS OF INCOME
(In millions, except per share amounts)

	Three Months Ended June 30,		Six Months Ended June 30,	
	2011	2012	2011	2012
	(unaudited)			
Revenues:				
Google (advertising and other)	$ 9,026	$ 10,964	$17,602	$21,609
Motorola (hardware and other)	0	1,250	0	1,250
Costs and expenses:				
Cost of revenues – Google (advertising and other) (1)	3,172	3,984	6,107	7,773
Cost of revenues – Motorola (hardware and other) (1)	0	1,029	0	1,029
Research and development (1)	1,234	1,585	2,456	3,026
Sales and marketing (1)	1,091	1,433	2,117	2,702
General and administrative(1)	648	980	1,244	1,737
Charge related to the resolution of Department of Justice investigation	0	0	500	0
Total costs and expenses	6,145	9,011	12,424	16,267
Income from operations	2,881	3,203	5,178	6,592
Interest and other income, net	204	254	300	410
Income before income taxes	3,085	3,457	5,478	7,002
Provision for income taxes	580	672	1,174	1,327
Net income	$ 2,505	$ 2,785	$ 4,304	$ 5,675
Net income per share of Class A and Class B common stock:				
Basic	$ 7.77	$ 8.54	$ 13.37	$ 17.42
Diluted	$ 7.68	$ 8.42	$ 13.19	$ 17.17





(1) Includes stock-based compensation expense as follows:

Cost of revenues – Google (advertising and other)	$ 51	$ 82	$ 100	$ 156
Cost of revenues – Motorola (hardware and other)	0	5	0	5
Research and development	247	291	484	590
Sales and marketing	74	120	152	217
General and administrative	63	160	130	246

See accompanying notes.

The purpose of a financial report is to convey meaning. The meaning conveyed by the fact table which is machine-readable and the meaning conveyed by the human-readable rendering is the same.

Within the rendering you can better see the relations between the facts. For example "Income before income taxes" of 5,853 less the "Provision for income taxes" of 1,626 equals "Net income" of 4,227 for the period 2008. This relation between facts is called a "roll up". Relations between facts are expressed using business rules. These relations between line items are called concept arrangement patterns. A Block is a report fragment that exists in the same concept arrangement pattern. Blocks can share member arrangement patterns with all other blocks within the component the contains the block.

Different industries/activities and different reporting entities organize their facts in different ways. These organizations of facts are called reporting styles. Different reporting styles organize facts into high-level fundamental accounting concept relations which never change for any given reporting style. As such, the fundamental accounting concept relations provide "key stones" or "corner stones" of the relationships within a financial report. These relations are continuity checks what help make sure fundamental concepts used in different parts of a report do not contradict or conflict with one another.

Common characteristics of financial facts exist such as "reporting entity", "legal entity", "report date", "reporting scenario", "concept", and "period". Other characteristics exist which may, or may not, be appropriate for a specific reported fact.

Facts may have zero or many parenthetical explanations associated with them.

Financial reports, the components which make up a financial report, the facts within a financial report, the characteristics which describe facts, the relations between facts, and parenthetical explanations which further describe facts each has a specific set of properties. For example, a component has a label which might be "Income statement". A concept characteristic "Net Income" has a balance type property of "credit".

While we have only shown one component above, a financial report is generally made up of numerous components. Components are ordered or sequenced into a particular order by the financial report creation software and/or financial report analysis software.

And so now you have the logical, mechanical, and structural relations between the pieces that make up the conceptual model of an XBRL-based digital financial report. To solidify your understanding, try navigating an XBRL-based public company financial repot using the XBRL Cloud Viewer for an public company financial filing to the SEC from a free publically available tool from the Edgar Dashboard[17].

1.14. Universe of Discourse

A universe of discourse is the set of all things under consideration during a discussion, examination, or study.

A universe of discourse is the set of all objects or entities that is defined by a model. XBRL-based digital financial reporting is NOT conceptually promiscuous; you simply cannot add new pieces to the model. The model is the shape of the information not what goes into that shape.

Axioms and theorems assert knowledge. Constraints are restrictions on existing knowledge. Constraints can be used to detect incomplete information. Constraints can be used to check knowledge for inconsistencies and contradictions. Axioms, theorems, constraints, and other sorts of rules all follow the rules of logic. The rules of logic are the common denominator.

Business users interact with the model using the semantic level of these "Conceptual Legos" that expose logical pieces that are understandable by the user of the system. The system is not a "black box", rather the system is transparent do that the business professional using the system understands what the system is doing.

Digital financial reporting requires that every user of the system share the same universe of discourse, the same fundamental model, and the same logical rules. The goal is that every interpretation of the model is consistent with the intended interpretation of the model. The model is formal, the model is definable, and the model has a finite set of shapes.

[17] *XBRL Cloud Edgar Dashboard*, https://edgardashboard.xbrlcloud.com/edgar-dashboard/