

1. Reference to Logical Theory Terminology

The purpose of this section is to provide a comprehensive reference to the terminology of the Logical Theory Describing Financial Report and a reference of that terminology to an XBRL implementation.

In this section we describe the financial report model elements which are used to implement a digital financial report. See the appendix, Report Element Properties, which provides a reconciliation between the *Financial Report Semantics and Dynamics Theory*¹ to this model.

This model is based on the model used by XBRL International *Open Information Model*², the US GAAP XBRL Taxonomy Architecture, and SEC XBRL-based financial filings. Rather than reinventing another set of terminology, that terminology was used. Further, while there are a variety of approaches which could be used and still follow this model; we are using and would encourage an allowed by strict interpretation of this model.

This is only one of many XBRL-based digital financial report profiles which may ultimately exist. The *Public Companies using US GAAP Reporting to SEC Profile*³ is documented as part of the conceptual model⁴. This profile is an implementation model for working with XBRL-based digital financial reports.

1.1. Reconciling XBRL technical syntax to the Conceptual Model

This section provides a high level overview of XBRL technical syntax terminology and reconciles that terminology to the financial report conceptual model. This section is useful to those more familiar with the XBRL technical syntax than with this conceptual model.

From a technical syntax perspective, a digital financial report consists of two primary physical objects using the XBRL technical syntax: an *XBRL instance* and an *XBRL taxonomy*.

An **XBRL instance** is a physical document just like any HTML document or Word document which contains the financial information reported. While the information is the same, the format of the information is different, it is XBRL. An XBRL instance contains things such as:

- The financial and nonfinancial **facts** which you report. An example of a fact is Cash and Cash Equivalents for the current fiscal period of December 31, 2010, reported by the consolidated entity which has the SEC CIK number 0123456789 whose value is \$1,000,000 reported in thousands of US Dollars. Conceptual model facts are represented by XBRL facts.

¹ Charles Hoffman and Rene van Egmond, *Financial Report Semantics and Dynamics Theory*, <http://xbrl.squarespace.com/fin-report-sem-dyn-theory/>

² XBRL International, *Open Information Model 1.0*, <https://specifications.xbrl.org/work-product-index-open-information-model-open-information-model.html>

³ *Public Companies using US GAAP Reporting to SEC Profile*, <http://xbrl.azurewebsites.net/2016/conceptual-model/reporting-scheme/us-gaap/>

⁴ *Conceptual Model of an XBRL-based Digital Financial Report*, <http://xbrl.azurewebsites.net/2016/conceptual-model/index.html>

- The **values** of those financial and nonfinancial facts. The value \$1,000,000 is an example of a fact value.
- **Characteristics** which describe those facts. The CIK number 0123456789, the consolidated entity, the period December 21, 2010 are examples of characteristics. Characteristics are represented by the contexts contained in an XBRL instance which can be supplemented by XBRL Dimensions.
- **Other traits** which help you understand values of facts which are numeric in nature. Stating that the value is in US Dollars and expressed in thousands are examples of other attributes. Units are part of an XBRL fact as are decimals.
- Any other **parenthetical explanations or footnotes** which help describe those facts. You may want to provide some kind of notation which appears as a footnote within your report. These are represented using XBRL footnotes.

Not that you would ever need to look at this XBRL instance, it is really meant for computers to understand and process for the user of the information; but if you are curious, this is what XBRL looks like:

```
<us-gaap:CashAndCashEquivalentsAtCarryingValue contextRef="I-2010" unitRef="U-Monetary" decimals="-3">11000000</us-gaap:CashAndCashEquivalentsAtCarryingValue>  
<us-gaap:RestrictedCashAndInvestmentsCurrent contextRef="I-2010" unitRef="U-Monetary" decimals="-3">1000000</us-gaap:RestrictedCashAndInvestmentsCurrent>  
<us-gaap:ShortTermInvestments contextRef="I-2010" unitRef="U-Monetary" decimals="-3">1000000</us-gaap:ShortTermInvestments>
```

It may seem odd to express all the details described above, but remember; computers are not very smart. Things that humans can generally figure out by reading a report have to be expressed explicitly and precisely so that a computer can understand what to do with them.

The second major piece of a digital financial report is the XBRL taxonomy. An **XBRL taxonomy** can be thought of as a dictionary of sorts. The taxonomy provides the definitions of the concepts used in your report, definitions of many of the characteristics which help explain your financial report, relations between the concepts and characteristics, and the business rules which exist between concepts. All this information is used by software processing the XBRL instance.

Some of the concepts, characteristics, relations, and business rules are pre-defined for you by the FASB in the US GAAP XBRL Taxonomy. But each SEC filer can also create the concepts, characteristics, relations and business rules that uniquely characterize their economic entity.

Part of the art and science of using XBRL is to figure out when you use the predefined concepts and characteristics and when to define your own. The taxonomy helps keep things logical. The US GAAP XBRL Taxonomy should be internally consistent, any extension created should be consistent with the US GAAP XBRL Taxonomy.

XBRL is a technical syntax. The XBRL technical syntax is implemented by the US GAAP XBRL taxonomy using a specific architecture or application profile. This application profile is laid out in the US GAAP Taxonomy Architecture. That architecture exposes a logical model.

An XBRL-based public company financial report that is submitted to the SEC can be deconstructed into a concise set of logical components, a logical model: Networks, [Table]s, [Axis], [Member]s, [Line Items], Concepts, [Abstract]s, facts, etc. These terms are easier to work with and understand than the XBRL technical syntax.

The US GAAP XBRL Taxonomy which is used for XBRL-based public company financial reports is also used for this digital financial report conceptual model. Further, this same model can be applied to more digital financial reporting generally and even to digital business reporting. For example, a similar profile was created for IFRS-based financial reporting.

Next we look at the implementation model of an XBRL-based financial report that public companies create and submit to the SEC.

1.2. Report elements overview

The following is an overview of the report element categories into which all report elements fit which make up this model. Each of these report element categories will be explained in further detail within this section.

- **Network:** A network is one approach to break a digital financial report into smaller pieces or report fragments. There are two reasons why you might need to break a financial filing into pieces: because you want to or because you have to. Specific semantics of networks are undefined.
- **Table:** A table is used to combine facts which go together for some specific reason. Tables are comprised of axis and line items. The line items of a table share the axis defined within a table. There are two types of tables: explicit tables and implicit tables. Implicit tables only have the axis reporting entity and period. An explicit table always has at least one defined [Axis], it could have more than one. An explicit [Table] always has one set of [Line Items]. Specific semantics of tables are undefined. Per XBRL technical syntax rules, a [Table] is not required to have an [Axis].
- **Axis:** An axis is a means of providing information about the characteristics of a fact reported within a financial report.
- **Member:** A member is a possible value of an [Axis]. A [Member] is always part of a domain of an [Axis], thus the term "member" (i.e. of the domain or set; a domain is simply a set of [Member]s which relates to a specific [Axis]). Members of an [Axis] tend to be cohesive and share a certain common nature.
- **Line Items:** [Line items] are a set of concepts which can be reported by an entity, they can contain values. [Line Items] may also contain [Abstract] concepts which can never report values but rather are used to help organize the [Line Items].
- **Concept:** A concept refers to a financial reporting concept or a non-financial concept which can be reported as a fact within an SEC XBRL-based financial filing. A concept is sometimes referred to as a concrete concept, as compared to an abstract concept (see next report element). [Line Items] contain Concepts organized within a component which have the same information model. Concepts can be concrete (meaning they can be reported) or abstract (meaning that they are never reported; they are only used to organize the concepts contained within a set of line items).
- **Abstract:** An Abstract is a class of Concept. Abstracts are used for organization and can never be reported. Abstracts can be used within a [Line Items] or it can be used to organize the Tables within a Network.

- **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 characteristics. Numeric fact values must also provide the additional traits “units” and “rounding” to enable appropriate interpretation of the numeric fact value. Facts may have zero or many parenthetical explanations which provide additional descriptive information related to the fact.

Information expressed by a digital financial report are called **facts**. Facts are expressed within **tables** which connect a set of **axis** which express the characteristics of the facts and a set of **line items** which connect the facts to some financial reporting **concept**. Tables can be organized within **networks**. The characteristics of the fact, expressed as an axis are organized into a domain of **members**. In addition, **footnotes** can be used to elaborate on facts.

For example, Net Income (Loss) [a concept] of \$1000 [the value of a fact] for the period ended December 31, 2010 [a characteristic of the fact] for the consolidated entity [another characteristic of the fact] of the reporting entity with the CIK number 1080224 [yet another characteristic of the fact] may be a fact reported within an SEC XBRL-based filing.

1.3. Network

A **network** is a one approach to break a digital financial report into smaller pieces. There are two reasons why you might need to break a financial filing into pieces: because you want to or because you have to.

Networks you create have a direct impact on what is seen within a rendering engine such as the SEC XBRL Interactive Data Viewer and other software that produce renderings of SEC XBRL financial filings or other digital financial reports.

Consider the following screen shot of the SEC Interactive Data Viewer:

Google Inc. (Filer) CIK: 0001288776

Print Document View Excel Document

Cover	Document and Entity Information	6 Months Ended	
		Jun. 30, 2012	Jul. 19, 2012
Document and Entity Information		Class A Common Stock	Class B Common Stock
Financial Statements	Document Information [Line Items]		
CONSOLIDATED BALANCE SHEETS	Document Type	10-Q	
CONSOLIDATED BALANCE SHEETS (Parenthetical)	Amendment Flag	false	
CONSOLIDATED STATEMENTS OF INCOME	Document Fiscal Year Focus	Jun. 30, 2012	
CONSOLIDATED STATEMENTS OF INCOME (Parenthetical)	Document Fiscal Period Focus	Q2	
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME	Trading Symbol	GOOG	
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (Parenthetical)	Entity Registrant Name	Google Inc.	
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (Parenthetical)	Entity Central Index Key	0001288776	
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (Parenthetical)	Current Fiscal Year End Date	--12-31	
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (Parenthetical)	Entity Filer Category	Large Accelerated Filer	
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (Parenthetical)	Entity Common Stock, Shares Outstanding		261,972,044 65,061,281

And now consider this screen shot of the XBRL taxonomy which supports the XBRL instance being viewed within the SEC XBRL Interactive Data Viewer:

- ⊕ Network (101 - Document - Document and Entity Information)
- ⊕ Network (103 - Statement - CONDENSED CONSOLIDATED BALANCE SHEETS)
- ⊕ Network (104 - Statement - CONDENSED CONSOLIDATED BALANCE SHEETS (Parenthetical))
- ⊕ Network (105 - Statement - CONDENSED CONSOLIDATED STATEMENTS OF OPERATIONS)
- ⊕ Network (106 - Statement - CONDENSED CONSOLIDATED STATEMENTS OF CHANGES IN COMMON STOCKHOLDERS' EQUITY)
- ⊕ Network (107 - Statement - CONDENSED CONSOLIDATED STATEMENTS OF CASH FLOWS)
- ⊕ Network (108 - Disclosure - BASIS OF PRESENTATION)
- ⊕ Network (109 - Disclosure - REVENUE RECOGNITION)
- ⊕ Network (110 - Disclosure - INCOME (LOSS) PER SHARE)
- ⊕ Network (111 - Disclosure - SOFTWARE DEVELOPMENT COSTS)
- ⊕ Network (112 - Disclosure - LONG-TERM DEBT)
- ⊕ Network (113 - Disclosure - STOCK-BASED COMPENSATION)
- ⊕ Network (114 - Disclosure - CONCENTRATION OF RISK AND FAIR VALUE OF FINANCIAL INSTRUMENTS)
- ⊕ Network (115 - Disclosure - SEVERANCE COSTS)
- ⊕ Network (116 - Disclosure - REDEEMABLE PREFERRED STOCK)
- ⊕ Network (117 - Disclosure - RELATED PARTY TRANSACTIONS)
- ⊕ Network (118 - Disclosure - INCOME TAXES)
- ⊕ Network (119 - Disclosure - RECENT ACCOUNTING PRONOUNCEMENTS)
- ⊕ Network (120 - Disclosure - MERGER AGREEMENT AND STOCK SALE AGREEMENT)

Creating a network causes a section to appear within the left hand navigation pane of the SEC XBRL Interactive Data Viewer application. You can create these networks as you desire to organize how this information would appear within a software application.

These networks have three parts: a *number*, a *sort category*, and a *label*. The number determines the order of the network in the rendering. The category determines which section the network appears in the SEC XBRL Interactive Data Viewer. The categories are: Document, Statement, Disclosure, and Schedule. The label provides specific information about what the network contains.

The second reason you would create a network is because you have to. Suppose, for example, that you wanted to articulate the breakdown of trade receivables in multiple ways, such as:

	2010	2009
TRADE AND OTHER RECEIVABLES		
Trade and Other Receivables, Net, by Component		
Trade Receivables, Net	8,790	6,431
Financing Lease Receivables, Net	2,498	1,263
Other Receivables, Net	1,305	1,096
Trade and Other Receivables, Net	12,593	8,790
Trade and Other Receivables, Net, by Net/Gross		
Trade and Other Receivables, Gross	18,280	13,472
Allowance for Doubtfull Accounts	-5,687	-4,682
Trade and Other Receivables, Net	12,593	8,790
Trade and Other Receivables, Net, by Current/Noncurrent		
Trade Receivables, Net, Current	6,340	5,701
Trade Receivables, Net, Noncurrent	6,253	3,089
Trade and Other Receivables, Net	12,593	8,790

Note that all three breakdowns of *Trade and Other Receivables, Net* have the same total but different facts are used to represent the details of what is rolling up. A network separates things which would otherwise collide. To avoid these three breakdowns of the same concept “Trade and Other Receivables, Net” from colliding; a network must be created for each to separate them. As such, you may need to create networks sometimes when you would prefer not to.

HINT: The term “network” may seem odd. But this is actually just like how different radio or television frequencies are separated, thus the term network.

1.3.1. Number

A network is assigned a number. The number is used to order or provide a sequence for the networks.

1.3.2. Sort Category

A network has a sort category. The categories are: Document, Statement, Schedule, and Disclosure. The category impacts which section of the SEC interactive viewer the network shows up.

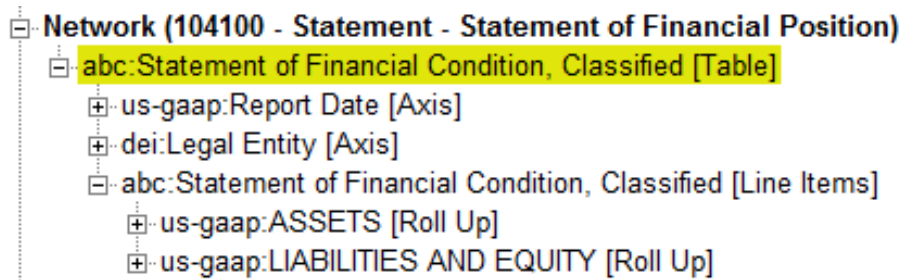
1.3.3. Title

A network has a title. The title describes what the network contains.

1.4. Table

A **table** is used to combine facts which go together for some specific reason or purpose. Tables are comprised of axis and line items. The line items of a table share the axis defined within a table.

There are two types of tables: explicit tables and implicit tables. Implicit tables only have the core aspects reporting entity, period, and concept. An explicit table always has at least one explicit axis which is provided by the table creator, it could have more than one. An explicit table always has exactly one set of line items.



Note the table above which has two **axis** “Report Date [Axis]” and “Legal Entity [Axis]” and one set of **line items** “Statement of Financial Condition, Classified [Line Items]”.

HINT: Defining unique, smaller, explicit tables is superior to using the implicit tables, repeating table names, and larger tables. Further, you get better control over the SEC Interactive Data Viewer and other rendering software with smaller explicit tables.

HINT: Generally it is better to have a one-to-one correlation between a network and a table. This approach is generally safer and therefore more reliable and more predictable in terms of rendering in different software applications. However, it is acceptable for a network to contain more than one table.

1.4.1. *Explicit tables*

You can use a table from the US GAAP taxonomy or you can define your own tables. For example, you might create the table “Debt Instruments [Table]” if you needed it but it did not exist within the US GAAP taxonomy.

1.4.2. *Implicit tables*

There is another way you can create a table which is to use what amounts to an implied table. If you define concepts in your taxonomy and you do not explicitly put them into an existing US GAAP taxonomy table or a table which you define, you are putting that concept into an implicit table. Facts do not float freely within an XBRL report. Facts always exist within a network. Every XBRL network essentially contains an implied table if an explicit table is not provided.

HINT: Using implied tables is not encouraged, defining tables explicitly is a better approach.

1.5. *Axis*

An **axis** is a means of providing information about the characteristics or aspects⁵ of the concepts for the line items within a table regardless of whether that table is explicitly or implicitly defined.

Explicitly defined [Table]s are the only tables to which you can add axes. All tables, be they explicitly defined or implicitly defined, have three axis which will always exist: entity, period, and concept. These axis are defined by and required by the XBRL technical syntax and are called core aspects in the XBRL International Open Information Model.

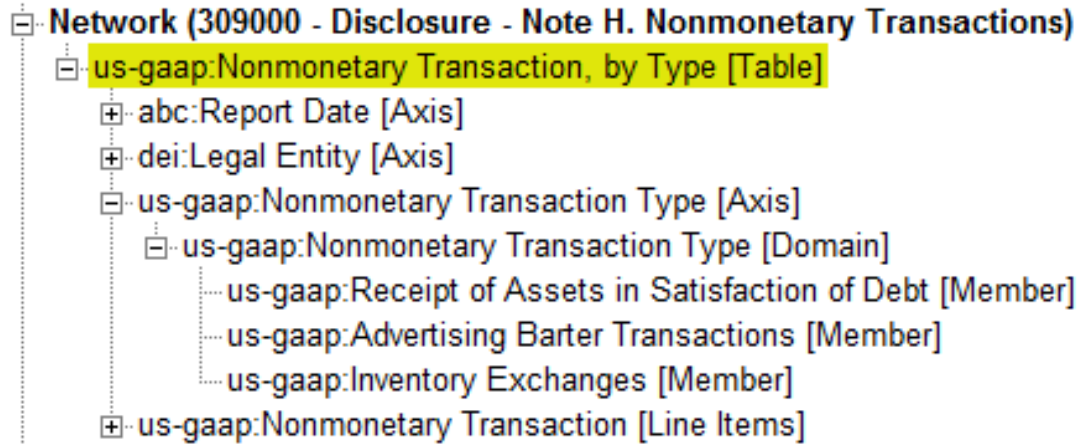
- **Entity:** The entity, or “Reporting Entity” axis, always exists for an explicit or implicit table and the entity axis is always the SEC filer CIK number.
- **Period:** The period axis, or reporting period, always exists for an explicit or implicit table.
- **Concept:** The concept axis always exists for an explicit or implicit table.

Using axis defined by the US GAAP XBRL Taxonomy is preferred and would commonly be available; but if an axis which you need does not exist, you can create an axis to articulate the characteristics you need communicated. [Axis] or aspects defined by a taxonomy are referred to as taxonomy-based aspects by the XBRL International Open Information Model. Other explicit axis which might be defined could include things such as:

- Class of common stock [Axis]
- Subsequent event type [Axis].

Here is an example of a [Table], its three [Axis], and its [Line Items]:

⁵ XBRL International, *Open Information Model*, <https://specifications.xbrl.org/work-product-index-open-information-model-open-information-model.html>



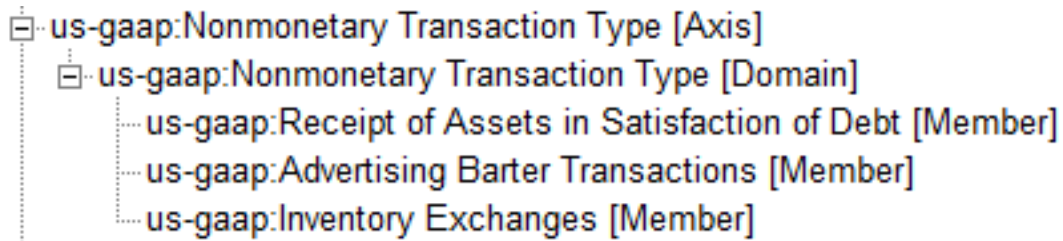
Note the **axis** "Nonmonetary Transaction Type [Axis]" above, its **domain** and its **members**.

HINT: The [Line Items] of a [Table] is a special type of [Axis] or aspect. What is unique about the Concepts within a set of [Line Items] is that they have a data type, a period type, a balance type, and they will contain a value within an XBRL instance.

1.6. Member

A **member** is a possible value of an axis. A member is always part of a domain of an axis, thus the term "member" (i.e. of the domain or set). Members of an [Axis] tend to be cohesive and share a certain common nature. A member expresses the value of the axis or characteristic being described. For example, the "Consolidated Entity [Member]" might be the value of the characteristic "Legal Entity [Axis]".

Here is an example of an axis and its domain of members:



1.7. Member arrangement patterns

The **members** of a domain have relations to one another. These relations are referred to as **member arrangement pattern**.

1.8. Line items

Line items contain a set of concepts which can be reported by an entity, they can contain values.

Line items are what amounts to a special type of axis or characteristic. Because the concepts within a set of line items can report fact values, they have data types such as string, monetary, etc. They may also have a balance type (debit or credit), a period type (as of a point in time, for some period, etc.), and a few other attributes.

1.9. Component

A **component** is a fragment of a report made up of a combination of a network and a table. A component is a set of facts which go together for some specific purpose. Because a network and table have undefined semantics, likewise a component must have undefined semantics.

HINT: Taxonomies such as the US GAAP Taxonomy SHOULD define specific semantics for networks and tables. If such semantics were known, then the semantics of a component would be clear. Each reporting entity can, and generally does, have their scheme or approach to how they create the many pieces which make up their financial report. That is their scheme. Each scheme could be different. There are exactly three approaches to defining components: use only networks (and make all tables the same), use only tables (and make networks meaningless) or use both networks and tables. If an approach where tables are used, each table should be unique (have a unique name). Having one table have multiple meanings (i.e. polymorphic) causes issues with using financial report information.

1.10. Block

A **block** is a sub set of line items which have the same concept arrangement pattern and go together for some specific purpose. A block is an artificially defined unit of a financial report created for the convenience of discussing the fragments of a digital financial report. A block could have a root abstract report element or if an explicit abstract report element does not exist, an implied abstract report element is used to represent the root of a block.

For example, a balance sheet has two blocks: "Assets [Roll Up]" and "Liabilities and Equity [Roll Up]".

HINT: A table always has at least one block and may have any number of blocks.

1.11. Concept

A **concept** refers to a financial concept or a non-financial concept which can be reported as a fact within a digital financial report. A concept is sometimes referred to as a concrete concept, as compared to an abstract concept (see next section).

Line items contain concepts organized within a block which have the same concept arrangement pattern. Concepts can be concrete (meaning they can be reported) or abstract (meaning that they are never reported; they are only used to organize the concepts contained within a set of line items).

1.12. Abstract

An **abstract** refers to a concept which is used only for organizational purposes and can never be actually reported.

HINT: The term abstract as it is being used here is NOT the same as the XML Schema abstract attribute.

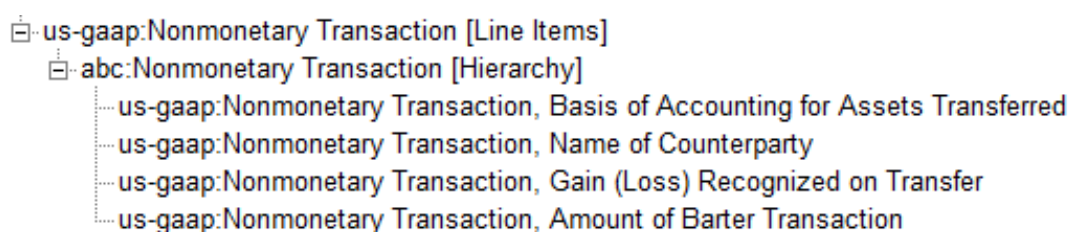
1.13. Concept arrangement patterns

A **concept arrangement pattern** describes the organization or relation between concepts within a block.

Concepts are not ever interspersed randomly within a table; they have patterns. Said another way, concepts are organized into different concept arrangement patterns. A block is a set of concepts which have the same concept arrangement pattern which are organized and used together for some specific purpose.

The common concept arrangement patterns include: hierarchy, roll up, roll forward, adjustment, variance, complex computation, text block, compound fact (a pseudo pattern), and grid (a pseudo pattern).

Here is an example of line items which contain abstract and concrete concepts organized into a concept arrangement pattern:



The above screen shot shows the [Line Items] of a nonmonetary transaction. These [Line Items] are organized within the component “Nonmonetary Transaction [Hierarchy]”. The component has four concepts. The [Table] and [Axis] are not shown.

1.14. Business rules

A **business rule** is a relation between reported facts. Business rules can be used to validate the values of the facts contained within a report are logically, mechanically, structurally, and mathematically correct.

1.15. Fact

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. Numeric fact values must also provide the additional traits “units” and “rounding” to enable appropriate interpretation of the numeric fact value. Facts may have zero or many parenthetical explanations which provide additional descriptive information related to the fact.

A fact could be numeric, non-numeric (i.e. strings), or narrative/prose (i.e. Text Block).

Facts are composed of and are an intersection of **axis**, **line items** (remember that line items are a special type of axis which express a concepts), and a **value**. The value of a reported fact is referred to as a fact value. A fact value has fact traits if it is numeric. A fact may also have a **footnote**.

The characteristics of a fact are described by the **axis** collection. Recall that there are three axis that are always required, the entity, the period, and the concept. Additional axis can be added to further characterize a fact. The concept is one

characteristic of the fact. So, facts have values, they have an axis which describes its characteristics, and they have fact traits which further describe the value. Numeric facts have an amount and non-numeric facts are made up of textual information. Narratives, or prose, are basically XHTML (technically narratives are escaped XHTML which is converted by software to HTML).

Facts exist within a **fact table**. A **fact table** is simply a set of one or more facts.

1.15.1. Intersection with line items (concepts)

A **fact** is associated with a concept, they reference a concept within the set of **line items**.

1.15.2. Intersection with axis

Facts are associated with axis which articulate characteristics, they reference a set of axis within an implicit or explicit table.

HINT: A fact will always have a "Reporting Entity [Axis]", a "Period [Axis]", and a [Line Items] or Concept [Axis] (i.e. the core aspects) as they are required by the XBRL technical syntax. Because of this undesired calculation inconsistencies can exist in an SEC XBRL financial filing. See the appendix on the causes of calculation inconsistencies in the appendix.

1.15.3. Value

Facts have a value which can be numeric or non-numeric. An important non-numeric value type is a narrative or [Text Block] which is a fragment of escaped XHTML.

1.15.4. Fact traits

If the **fact** is numeric, it has two traits which describe additional information needed by numeric facts: **units** and **decimals** (rounding). **Units** provides information about this units of the numeric fact such as monetary, shares, or some other units. The **decimals** (rounding) provides information as to the number of decimal places to which the number is accurate, such as to the thousands, millions, billions, hundredths, etc.

1.16. Footnote (parenthetical explanation)

Facts may also have **footnotes** (parenthetical explanations, don't confuse this with notes to the financial statements) which provide addition information about the fact.

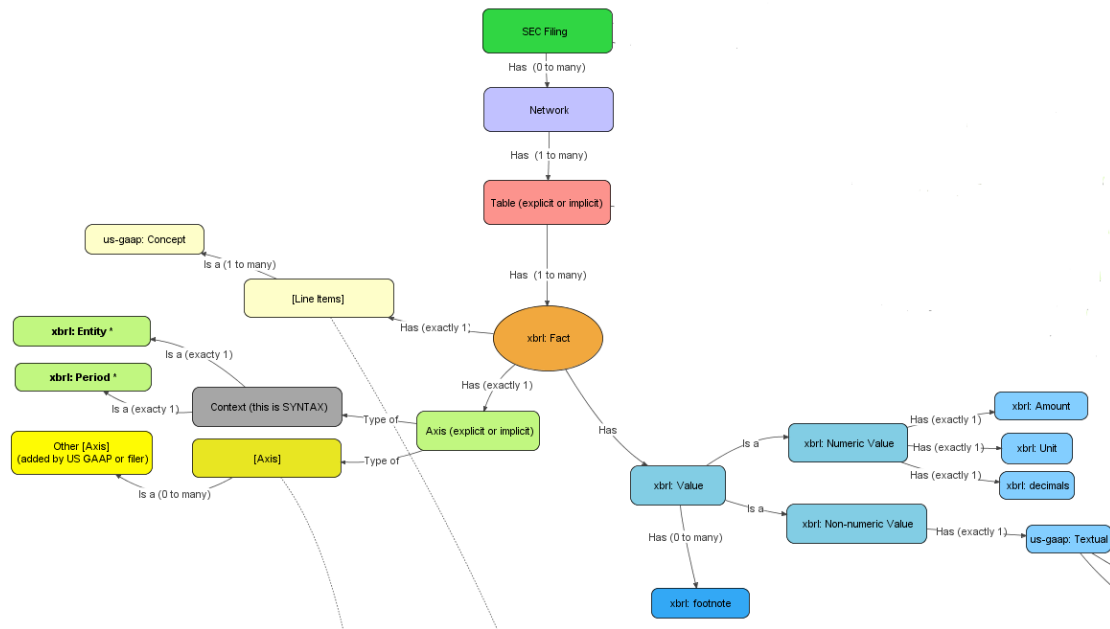
1.17. Report Fragment Arrangement Patterns

Flow is the notion of relations between the report fragments of a report. Networks, Tables, Components, and Blocks are all identifiable and addressable report fragments. These report fragments can be ordered or sequenced within a report.

1.18. Conceptual Model of a Digital Financial Report Visual Summary

This graphic below depicts what we have discussed thus far, showing the report elements for the model we have discussed and also showing the relationships

between these report elements expressed as a visual model. Each of these report elements is represented as a box. The lines show the relationships between the report elements. The text on the line provides information about the relationship:



The relations between report elements will be expanded upon in the next section of this document.

1.19. Summary narrative of financial report conceptual model

A **digital financial report**, such as an XBRL-based public company financial report which is submitted to the SEC can be logically broken down into pieces or **report elements**. These report elements can be categorized and given names so that they can be referred to precisely.

A **fact** defines a single, observable, reportable piece of information contained within a digital financial report, or fact value, contextualized for unambiguous interpretation or analysis by one or more characteristics.

Information, or facts reported, can be grouped. Groups or sets of information reported which go together for some specific purpose are called a **component**. A component is a fragment of a report. Components can have one or many blocks.

A component is expressed using networks and tables. A table can be organized within a network. **Networks** organize where **tables** show up in software applications which render information such as the SEC Interactive Data viewer application. Networks have numbers, a sort category, and a title. There are categories of networks: Document, Statement, Schedule, and Disclosure. The numbers within the network names determine the ordering of the networks within rendering software applications.

Tables are groupings of **facts** which appear in a financial report for some specific purpose. Facts within a table have similar characteristics. **Axes** articulate these characteristics or aspects. **Line items** are a special type of axis or aspects. Line items contain concepts. These **concepts** can describe **fact values** in a digital

financial report. Every fact always have three required characteristics: Reporting entity (entity context), period (period context), and concept. Taxonomy creators can add one or many additional explicit axes to a table.

The value of an axis is a **member**. Axis always has one or more domains which is its set of members. A domain may be broken down into one or more partitions. (US GAAP XBRL Taxonomy and SEC filings only allow ONE domain partition.) There are three axis which must always exist: reporting entity, period, and concept.

Numeric values have two additional traits: units and decimals (or rounding). **Units** explain the units of a numeric value and **decimals** explain the rounding of a numeric value. Fact values may also have **footnotes** which provide additional descriptive information about a specific value or a set of values. **Traits** play no role in processing axis, they are traits of the fact and not characteristics.

Facts reported do not have random relationships, the relationships between facts have patterns, this is referred to as a **concept arrangement pattern**. A table may contain numeric concepts within **blocks** which have concept arrangement patterns such as **roll up, roll forward, adjustment, variance, complex computations**, etc. If the numeric information has no relationship or only textual information is reported, the concept arrangement pattern is simply a **hierarchy**. The **text block** concept arrangement pattern is that of a narrative or prose and is reported as a block of HTML.

Likewise the members which make up the domain do not have random relations, the relations of the members of an axis have patterns referred to as the **member arrangement pattern**. There are two primary member arrangement pattern types. Whole-part member aggregation patterns has identical meaning as a roll up, the members are made up exactly the parts, nothing more, and the members add up. Is-a member arrangement patterns simply describe and are used to differentiate or distinguish reported facts.

Report fragment arrangement patterns articulate an ordering or sequencing of the report fragments or networks/tables/components/blocks within a digital financial report.

1.20. Digital financial report examples

The following are a number of examples which will provide additional explanation of how the report elements work together.

1.20.1. Identifying the conceptual model pieces

Note that you can see the pieces that make up the conceptual model of a digital financial report in the actual report:

Microsoft's 2016 10-K

<https://www.sec.gov/Archives/edgar/data/789019/000119312516662209/0001193125-16-662209-index.htm>



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MICROSOFT CORP (Filer) CIK: 0000789019

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Cover	INCOME STATEMENTS - USD (\$)			
	shares in Millions, \$ in Millions	Jun. 30, 2016	Jun. 30, 2015	Jun. 30, 2014
Document and Entity Information	Revenue			
Financial Statements	Product	\$ 61,502	\$ 75,956	\$ 72,948
	Service and other	23,818	17,624	13,885
INCOME STATEMENTS	Total revenue	85,320 ⁽¹⁾	93,580	86,833
	Cost of revenue			
COMPREHENSIVE INCOME STATEMENTS	Product	17,880	21,410	16,681
	Service and other	14,900	11,628	10,387
COMPREHENSIVE INCOME STATEMENTS (Parenthetical)	Total cost of revenue	32,780	33,038	27,078
	Gross margin	52,540	60,542	59,755
BALANCE SHEETS	Research and development	11,988	12,046	11,381
	Sales and marketing	14,697	15,713	15,811
BALANCE SHEETS (Parenthetical)	General and administrative	4,563	4,611	4,677
	Impairment, integration, and restructuring	1,110	10,011	127
CASH FLOWS STATEMENTS	Operating income	20,182	18,161	27,759
	Other income (expense), net	(431)	346	61
STOCKHOLDERS' EQUITY STATEMENTS	Income before income taxes	19,751	18,507	27,820
	Provision for income taxes	2,953	6,314	5,746
Notes to Financial Statements	Net income	\$ 16,798 ⁽²⁾	\$ 12,193 ⁽²⁾	\$ 22,074
Accounting Policies	Earnings per share:			
	Basic	\$ 2.12	\$ 1.49	\$ 2.66
Notes Tables	Diluted	\$ 2.10 ⁽²⁾	\$ 1.48 ⁽²⁾	\$ 2.63
	Weighted average shares outstanding:			
Notes Details	Basic	7,925	8,177	8,299
	Diluted	8,013	8,254	8,399
All Reports	Cash dividends declared per common share	\$ 1.44	\$ 1.24	\$ 1.12

[1] Reflects the impact of the net revenue deferral from Windows 10 of \$1.3 billion, \$1.7 billion, \$1.6 billion, and \$2.0 billion, for the first, second, third, and fourth quarter of fiscal year 2016, respectively, and \$6.6 billion for fiscal year 2016.
 [2] Includes \$630 million of asset impairment charges related to our phone business, and \$480 million of restructuring charges associated with our 2016 restructuring plans, which together decreased net income and diluted EPS by \$995 million and \$0.11, respectively.
 [3] Includes \$7.5 billion of goodwill and asset impairment charges related to our phone business, and \$2.5 billion of integration and restructuring expenses, primarily associated with our Phone Hardware Integration Plan and Phone Hardware Restructuring Plan, which together decreased net income and diluted EPS by \$9.5 billion and \$1.15, respectively.

HTML version:

https://www.sec.gov/Archives/edgar/data/789019/000119312516662209/d187868d10k.htm#tx187868_12

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA
INCOME STATEMENTS

(In millions, except per share amounts)

Year Ended June 30,	2016	2015	2014
Revenue:			
Product	\$ 61,502	\$ 75,956	\$ 72,948
Service and other	23,818	17,624	13,885
Total revenue	85,320	93,580	86,833
Cost of revenue:			
Product	17,880	21,410	16,681
Service and other	14,900	11,628	10,397
Total cost of revenue	32,780	33,038	27,078
Gross margin	52,540	60,542	59,755
Research and development	11,988	12,046	11,381
Sales and marketing	14,697	15,713	15,811
General and administrative	4,563	4,611	4,677
Impairment, integration, and restructuring	1,110	10,011	127
Operating income	20,182	18,161	27,759
Other income (expense), net	(431)	346	61
Income before income taxes	19,751	18,507	27,820
Provision for income taxes	2,953	6,314	5,746
Net income	\$ 16,798	\$ 12,193	\$ 22,074
Earnings per share:			
Basic	\$ 2.12	\$ 1.49	\$ 2.66
Diluted	\$ 2.10	\$ 1.48	\$ 2.63
Weighted average shares outstanding:			
Basic	7,925	8,177	8,299
Diluted	8,013	8,254	8,399
Cash dividends declared per common share	\$ 1.44	\$ 1.24	\$ 1.12

SEC Viewer:

https://www.sec.gov/cgi-bin/viewer?action=view&cik=789019&accession_number=0001193125-16-662209&xbrl_type=v#



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Cover	INCOME STATEMENTS - USD (\$) shares in Millions, \$ in Millions	12 Months Ended		
		Jun. 30, 2016	Jun. 30, 2015	Jun. 30, 2014
Document and Entity Information	Revenue			
Financial Statements	Product	\$ 61,502	\$ 75,956	\$ 72,948
	Service and other	23,818	17,624	13,885
INCOME STATEMENTS	Total revenue	85,320 ⁽¹⁾	93,580	86,833
	Cost of revenue			
COMPREHENSIVE INCOME STATEMENTS	Product	17,880	21,410	16,681
	Service and other	14,900	11,628	10,397
COMPREHENSIVE INCOME STATEMENTS (Parenthetical)	Total cost of revenue	32,780	33,038	27,078
	Gross margin	52,540	60,542	59,755
BALANCE SHEETS	Research and development	11,988	12,046	11,381
	Sales and marketing	14,697	15,713	15,811
BALANCE SHEETS (Parenthetical)	General and administrative	4,563	4,611	4,677
	Impairment, integration, and restructuring	1,110	10,011	127
CASH FLOWS STATEMENTS	Operating income	20,182	18,161	27,759
	Other income (expense), net	(431)	346	61
STOCKHOLDERS' EQUITY STATEMENTS	Income before income taxes	19,751	18,507	27,820
	Provision for income taxes	2,953	6,314	5,746
Notes to Financial Statements	Net income	\$ 16,798 ⁽²⁾	\$ 12,193 ⁽²⁾	\$ 22,074
	Earnings per share:			
Accounting Policies	Basic	\$ 2.12	\$ 1.49	\$ 2.66
	Diluted	\$ 2.10 ⁽²⁾	\$ 1.48 ⁽²⁾	\$ 2.63
Notes Tables	Weighted average shares outstanding:			
	Basic	7,925	8,177	8,299
Notes Details	Diluted	8,013	8,254	8,399
	Cash dividends declared per common share	\$ 1.44	\$ 1.24	\$ 1.12
All Reports				

- [1] Reflects the impact of the net revenue deferral from Windows 10 of \$1.3 billion, \$1.7 billion, \$1.6 billion, and \$2.0 billion, for the first, second, third, and fourth quarter of fiscal year 2016, respectively, and \$6.6 billion for fiscal year 2016.
- [2] Includes \$630 million of asset impairment charges related to our phone business, and \$480 million of restructuring charges associated with our 2016 restructuring plans, which together decreased net income and diluted EPS by \$895 million and \$0.11, respectively.
- [3] Includes \$7.5 billion of goodwill and asset impairment charges related to our phone business, and \$2.5 billion of integration and restructuring expenses, primarily associated with our Phone Hardware Integration Plan and Phone Hardware Restructuring Plan, which together decreased net income and diluted EPS by \$9.5 billion and \$1.15, respectively.

XBRL Cloud Viewer:

<https://edgardashboard.xbrlcloud.com/flex/viewer/XBRLViewer.html#instance=http://www.sec.gov/Archives/edgar/data/789019/000119312516662209/msft-20160630.xml>

MICROSOFT CORPORATION (10-K) 1003 - Statement - INCOME STATEMENTS Statement [Table]				
Components				
1001 - Document - Document and Entity Information Statement [Table]	Reporting Entity [Axis]	0000789019 (http://www.sec.gov/CIK)		
1003 - Statement - INCOME STATEMENTS Statement [Table]	Legal Entity [Axis]	Entity [Domain]		
1004 - Statement - COMPREHENSIVE INCOME STATEMENTS Statement [Table]	Statement [Line Items]	Period [Axis]		
1005 - Statement - COMPREHENSIVE INCOME STATEMENTS (Parenthetical) Statement [Table]		2015-07-01 - 2016-06-30	2014-07-01 - 2015-06-30	2013-07-01 - 2014-06-30
1006 - Statement - BALANCE SHEETS Statement [Table]	Revenue			
1007 - Statement - BALANCE SHEETS (Parenthetical) Statement [Table]	Product	61,502,000,000	75,956,000,000	72,948,000,000
1008 - Statement - CASH FLOWS STATEMENTS Statement [Table]	Service and other	23,818,000,000	17,624,000,000	13,885,000,000
1009 - Statement - STOCKHOLDERS' EQUITY STATEMENTS Statement [Table]	Total revenue	85,320,000,000 ²	93,580,000,000	86,833,000,000
1010 - Disclosure - ACCOUNTING POLICIES Statement [Table]	Cost of revenue			
1011 - Disclosure - EARNINGS PER SHARE Statement [Table]	Product	17,880,000,000	21,410,000,000	16,681,000,000
1012 - Disclosure - OTHER INCOME (EXPENSE), NET Statement [Table]	Service and other	14,900,000,000	11,628,000,000	10,397,000,000
1013 - Disclosure - INVESTMENTS Statement [Table]	Total cost of revenue	32,780,000,000	33,038,000,000	27,078,000,000
	Gross margin	52,540,000,000	60,542,000,000	59,755,000,000
	Research and development	11,988,000,000	12,046,000,000	11,381,000,000
	Sales and marketing	14,697,000,000	15,713,000,000	15,811,000,000
	General and administrative	4,563,000,000	4,611,000,000	4,677,000,000
	Impairment, integration, and restructuring	1,110,000,000	10,011,000,000	127,000,000
	Operating income	20,182,000,000	18,161,000,000	27,759,000,000
	Other income (expense), net	(431,000,000)	346,000,000	61,000,000
	Income before income taxes	19,751,000,000	18,507,000,000	27,820,000,000
	Provision for income taxes	2,953,000,000	6,314,000,000	5,746,000,000
	Net income	16,798,000,000 ³	12,193,000,000 ⁴	22,074,000,000
	Earnings per share:			
	Basic	2.12	1.49	2.66
	Diluted	2.10 ³	1.48 ⁴	2.63
	Weighted average shares outstanding:			
	Basic	7,925,000,000	8,177,000,000	8,299,000,000
	Diluted	8,013,000,000	8,254,000,000	8,399,000,000
	Cash dividends declared per common share	1	1	1

Pesseraact Viewer:

The screenshot displays the Pesseraact Viewer interface. On the left, a 'Components (127)' pane shows a tree view of financial statement components, with '1003 - Statement - INCOME STATEMENTS' selected. The main area on the right shows the rendering of this component as an 'INCOME STATEMENTS' table. The table includes a header for 'Reporting Entity [Axis]' (0000789019) and 'Period [Axis]' (2015-07-01/2016-06-30, 2014-07-01/2015-06-30, 2013-07-01/2014-06-30). The table content is as follows:

Statement [Line Items]	2015-07-01/2016-06-30	2014-07-01/2015-06-30	2013-07-01/2014-06-30
Revenue			
Product	61,502,000,000	75,956,000,000	72,948,000,000
Service and other	23,818,000,000	17,624,000,000	13,885,000,000
Total revenue	85,320,000,000	93,580,000,000	86,833,000,000
Cost of revenue			
Product	17,880,000,000	21,410,000,000	16,681,000,000
Service and other	14,900,000,000	11,628,000,000	10,397,000,000
Total cost of revenue	32,780,000,000	33,038,000,000	27,078,000,000
Gross margin	52,540,000,000	60,542,000,000	59,755,000,000
Research and development	11,988,000,000	12,046,000,000	11,381,000,000
Sales and marketing	14,697,000,000	15,713,000,000	15,811,000,000
General and administrative	4,563,000,000	4,611,000,000	4,677,000,000
Impairment, integration, and restructuring	1,110,000,000	10,011,000,000	127,000,000
Operating income	20,182,000,000	18,161,000,000	27,759,000,000
Other income (expense), net	(431,000,000)	346,000,000	61,000,000
Income before income taxes	19,751,000,000	18,507,000,000	27,820,000,000
Provision for income taxes	2,953,000,000	6,314,000,000	5,746,000,000
Net income	16,798,000,000	12,193,000,000	22,074,000,000
Earnings per share:			
Basic	2.12	1.49	2.66
Diluted	2.10 ⁴	1.48 ²	2.63
Weighted average shares outstanding:			
Basic	7,925,000,000	8,177,000,000	8,299,000,000
Diluted	8,013,000,000	8,254,000,000	8,399,000,000
Cash dividends declared per common share	1	1	1

1.21. Inline XBRL

The SEC has been talking about moving to Inline XBRL. You can think of Inline XBRL as somewhat of an additional layer on top of XBRL. Nothing about representing the information contained within a report changes. What changes is that an additional piece, an XHTML rendering, is mapped to each reported fact.

The Inline XBRL presentation layer is not covered by this conceptual model. The conceptual model applies to the information representation layer.

1.21.1. Inline XBRL example

The following is an Inline XBRL example. The link below opens an Inline XBRL document in a viewer provided by the SEC.

<https://www.sec.gov/ix?doc=/Archives/edgar/data/27904/000002790416000029/dal930201610q.htm>

DELTA AIR LINES, INC.
Consolidated Balance Sheets
(Unaudited)

(in millions, except share data)

	September 30, 2016	December 31, 2015
ASSETS		
Current Assets:		
Cash and cash equivalents	\$ 1,638	\$ 1,972
Short-term investments	1,514	1,465
Accounts receivable, net of an allowance for uncollectible accounts of \$13 and \$9 at September 30, 2016 and December 31, 2015, respectively	1,996	2,020
Fuel inventory	424	379
Expendable parts and supplies inventories, net of an allowance for obsolescence of \$108 and \$114 at September 30, 2016 and December 31, 2015, respectively	351	318
Hedge derivatives asset	496	1,987
Prepaid expenses and other	910	915
Total current assets	7,329	9,056
Property and Equipment, Net:		
Property and equipment, net of accumulated depreciation and amortization of \$12,106 and \$10,871 at September 30, 2016 and December 31, 2015, respectively	24,105	23,039
Other Assets:		
Goodwill	9,794	9,794
Identifiable intangibles, net of accumulated amortization of \$824 and \$811 at September 30, 2016 and December 31, 2015, respectively	4,848	4,861
Deferred income taxes, net	3,150	4,956
Other noncurrent assets	1,722	1,428
Total other assets	19,514	21,039
Total assets	\$ 50,948	\$ 53,134
LIABILITIES AND STOCKHOLDERS' EQUITY		

Note that if you go to this Inline XBRL document and you view it using a standard browser, you can read the report. There are a number of features such as search and filtering. The Inline XBRL document is easy for humans to read. In addition, that same document is readable by machine-based processes.

1.21.2. *Benefits of inline XBRL*

Here is a summary of the advantages of Inline XBRL:

- **Decouples presentation and data model.** Using Inline XBRL allows for the "decoupling" of two things which, when dealt with together, cause problems. Inline XBRL allows the HTML aspect to deal with presentation, and therefore the creator of the data model is free to create a good data model and not try and get the presentation they are seeking by using the XBRL taxonomy. For example, SEC XBRL filers seek a certain presentation and to get that they leverage the only thing they think they have at their disposal with is the XBRL taxonomy. Using Inline XBRL for the presentation gives one precise control of the presentation. Not having to worry about the differences in presentation and presentation nuances allows for more "freedom" in creating a sound data model.
- **Document of record.** Inline XBRL offers the possibility of having a "document of record" which is readable by both humans (i.e. the HTML facet of Inline XBRL) and computers (i.e. the XBRL facet of Inline XBRL). One does need to be careful to ensure that the information communicated and viewed as HTML is identical to the information a computer application reads, both should be in sync. But that does not seem that challenging and it is certainly easier than what SEC XBRL filers have to do which is keep separate HTML and XBRL documents in sync.
- **Evolutionary path.** Inline XBRL seems to offer a nice evolutionary path which a lot of people seem to need. Personally, I am very confident that most people will eventually never use that HTML rendering in favor of the dynamic or "interactive" aspects of XBRL. For example, consider what I call the "hypercube jumping" (really has more to do with dimensions) and discuss in this blog post. But Inline XBRL does not take away the possibility of these dynamic features, they are still there to use, even if the XBRL is buried in an HTML document.
- **Zero difference between XBRL and Inline XBRL.** To a computer application trying to read the information, there is zero difference between a plain old XBRL instance and an Inline XBRL document. From the computer's perspective, they are 100% interchangeable.

Because of these advantages, there is enough of a probability that the SEC could move to Inline XBRL at some point in the future. This is worth keeping in the back of one's mind.

1.21.3. *Disadvantages of inline XBRL*

This is a summary of the apparent disadvantages of Inline XBRL:

- **More work.** In order to create the pixel perfect rendering which Inline XBRL is capable of providing, additional work needs to be done to map reported facts to their location in the rendering. A cost/benefit analysis can show the value of going through this additional work. But to do this analysis properly, one needs to see quality renderings of properly represented information using a quality rendering engine. Judging the renderings one sees today which are of poorly represented information and substandard rendering engines would not provide a fair assessment.

- **Text blocks not identifiable.** Currently, the SEC requires public companies to provide Level 1, Level 2, and Level 3 [Text Block]s of information within their reports. There is no standard way to identify a component of a report in the actual XHTML and therefore there is no way to identify [Text Block]s and be able to directly use what you can now use from the Level 1 footnotes, Level 2 policies, and Level 3 disclosures. This can be mitigated by the SEC continuing to require the Level 1 Note Text Blocks, Level 2 Policy Text Blocks, and Level 3 Disclosure Text Blocks.