Understanding Model Structure Rules (US GAAP Taxonomy Architecture)

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Most people don't seem to realize this but the US GAAP XBRL Taxonomy has an architecture document which explains important things about the US GAAP XBRL Taxonomy. In this document I want to focus on one aspect communicated by that architecture, the representation structure or "model structure" of the US GAAP Taxonomy Architecture.

The document explaining the US GAAP XBRL Taxonomy architecture has existed since the first version of the taxonomy. Here is the original version of the US GAAP Taxonomy Architecture:

http://xbrl.us/Documents/SECOFM-USGAAPT-Architecture-20080428.pdf

Here is the most current version of the US GAAP Taxonomy Architecture that I have been able to locate:

http://www.fasb.org/cs/ContentServer?site=FASB&c=Document_C&pagename=FASB%2FDocument_C%2FDocumentPage&cid=1176159701713

Notice section 4.5 of the US GAAP Taxonomy Architecture titled *Implementation of Tables* explains, or at least alludes to, relationships between the pieces which make up a [Table]. While it does not lay this information out perfectly, that section is helpful in understanding two things:

1. There are different categories of report elements which make up a taxonomy which uses the US GAAP Taxonomy.

2. There are specific relations between those different categories of report elements.

All report elements are not equal. Many people refer to these as "tags", but that is inappropriate. The term "tag" does nothing to establish categories or explain the differences between the categories, it simply lumps every piece of a taxonomy into one group.

This table in the US GAAP Taxonomy Architecture starts to show that there are different categories of report elements:

Figure 22. Correspondence of Presentation to Definition arcs

Presentation Parent Label	Presentation Child Label		Definition Source	Definition Target	Definition Arc Role (attribute value)
[Table]	[Line Items]		[Line Items]	[Table]	all (with contextElement = segment)
[Table]	[Axis]		[Table]	[Axis]	hypercube-dimension
[Line Items]	Any descendant		[Line Items]	Any descendant	domain-member
[Axis]	[Domain] or [Member]		[Axis]	[Member]	dimension-domain
[Axis]	[Domain] or [Member]		[Axis]	[Member]	dimension-default

Here is a more comprehensive breakdown of the different categories or report elements which make up the US GAAP Taxonomy and any extension to the US GAAP Taxonomy:

- **Network**: A network is 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.

- **Table**: A table is used to combine facts which go together for some specific reason. Tables are comprised of [Axis] and [Line Items].

- **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]. 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 financial filing. A concept is sometimes referred to as a concrete concept, as compared to an abstract concept (see next report element). 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.

Something often confusing to SEC XBRL financial filers is the fact that everything represented in a taxonomy used to support a financial report fits into those categories above whether there is an explicitly defined [Table] or whether there is not an explicitly defined [Table], i.e. the [Table] is implied.

The above paragraph is worth explaining in a bit more detail. Every fact reported within an SEC XBRL financial filings must have two characteristics, entity identifier and period, because the XBRL technical syntax requires both of those characteristics. When you need to add an additional characteristic, an [Axis] is created to express that characteristic. XBRL syntax rules require a [Table] to connect the [Axis] and the [Line Items] which are characterized by that [Axis].

One more piece of information and then I will give you a concrete example so that you can better understand what is being explained. Every fact reported within an SEC XBRL financial filing is assumed to relate to the consolidated entity unless the SEC specifies otherwise. Another way of saying this is that the Legal Entity [Axis] value of "consolidated entity" (which is represented by the member "Entity [Domain]") is implied to exist on every reported fact. You can also explicitly state that the Legal Entity [Axis] of a reported fact is the consolidated entity and in fact it is better to explicitly state this information for a number of reasons; but if you don't, someone using that report can safely and

correctly imply that the legal entity you are talking about is the consolidated entity should you not explicitly provide this information.

And so, the following two sets of reported facts are 100% equivalent in terms of meaning: (see http://goo.gl/5yD6e, notice the "Legal Entity [Axis]")

Reporting Entity [Axis]		0001087423 (http://www.sec.gov/CIK)	
Legal Entity [Axis]		Entity [Domain]	
		Period [Axis]	
Document Information [Line Items]		2013-03-01 - 2013-05-31	2013-06-28
Document Type		10-Q	
Amendment Flag		false	
Document Period End Date		2013-05-31	
Document Fiscal Year Focus		2014	
Document Fiscal Period Focus		Q1	
Trading Symbol		RHT	
Entity Registrant Name		RED HAT INC	
Entity Central Index Key		1087423	
Current Fiscal Year End Date		--02-28	
Entity Filer Category		Large Accelerated Filer	
Entity Common Stock, Shares Outstanding			189,304,464

And: (see http://goo.gl/q11ov, note that there is no Legal Entity [Axis])

Reporting Entity [Axis]		0000084129 (http://www.sec.gov/CIK)	
		Period [Axis]	
Document and Entity Information		2013-03-03 - 2013-06-01	2013-06-21
Document and Entity Information			
Entity Registrant Name		RITE AID CORP	
Entity Central Index Key		84129	
Document Type		10-Q	
Document Period End Date		2013-06-01	
Amendment Flag		false	
Amendment Description			
Current Fiscal Year End Date		--03-01	
Entity Well-known Seasoned Issuer			
Entity Voluntary Filers			
Entity Current Reporting Status		Yes	
Entity Filer Category		Large Accelerated Filer	
Entity Public Float			
Entity Common Stock, Shares Outstanding			909,615,997
Document Fiscal Year Focus		2014	
Document Fiscal Period Focus		Q1	

Looking at the model structure is helpful in seeing this so I will show that for both of these SEC XBRL financial filings also. Here is the first representation:

Label	Report Element Class	Period	Balance	Name
▼ Entities [Table]	[Table]			dei:EntitiesTable
▼ Legal Entity [Axis]	[Axis]			dei:LegalEntityAxis
Entity [Domain]	[Member]			dei:EntityDomain
▼ Document Information [Line Items]	[Line Items]			dei:DocumentInformationLineItems
Document Type	[Concept]	For Period		dei:DocumentType
Amendment Flag	[Concept] Boolean	For Period		dei:AmendmentFlag
Document Period End Date	[Concept] Date	For Period		dei:DocumentPeriodEndDate
Document Fiscal Year Focus	[Concept] GYear	For Period		dei:DocumentFiscalYearFocus
Document Fiscal Period Focus	[Concept] Token	For Period		dei:DocumentFiscalPeriodFocus
Trading Symbol	[Concept] NormalizedString	For Period		dei:TradingSymbol
Entity Registrant Name	[Concept] NormalizedString	For Period		dei:EntityRegistrantName
Entity Central Index Key	[Concept] Token	For Period		dei:EntityCentralIndexKey
Current Fiscal Year End Date	[Concept] GMonthDay	For Period		dei:CurrentFiscalYearEndDate
Entity Filer Category	[Concept]	For Period		dei:EntityFilerCategory
Entity Common Stock, Shares Outstanding	[Concept] Shares	As Of		dei:EntityCommonStockSharesOutstanding

And here is the second:

Label	Report Element Class	Period	Balance	Name
▼ Document and Entity Information [Table]				(Implied)
▼ *Document and Entity Information*	[Abstract]			rad:DocumentAndEntityInformationAbstract
Entity Registrant Name	[Concept] NormalizedString	For Period		dei:EntityRegistrantName
Entity Central Index Key	[Concept] Token	For Period		dei:EntityCentralIndexKey
Document Type	[Concept]	For Period		dei:DocumentType
Document Period End Date	[Concept] Date	For Period		dei:DocumentPeriodEndDate
Amendment Flag	[Concept] Boolean	For Period		dei:AmendmentFlag
Amendment Description	[Concept]	For Period		dei:AmendmentDescription
Current Fiscal Year End Date	[Concept] GMonthDay	For Period		dei:CurrentFiscalYearEndDate
Entity Well-known Seasoned Issuer	[Concept] Token	For Period		dei:EntityWellKnownSeasonedIssuer
Entity Voluntary Filers	[Concept] Token	For Period		dei:EntityVoluntaryFilers
Entity Current Reporting Status	[Concept] Token	For Period		dei:EntityCurrentReportingStatus
Entity Filer Category	[Concept]	For Period		dei:EntityFilerCategory
Entity Public Float	[Concept] Monetary	As Of	credit	dei:EntityPublicFloat
Entity Common Stock, Shares Outstanding	[Concept] Shares	As Of		dei:EntityCommonStockSharesOutstanding
Document Fiscal Year Focus	[Concept] GYear	For Period		dei:DocumentFiscalYearFocus
Document Fiscal Period Focus	[Concept] Token	For Period		dei:DocumentFiscalPeriodFocus

In terms of the meaning of the information, both the first and second representations are exactly the same even though the first explicitly provide the "Legal Entity [Axis]" and the second did not explicitly provide that [Axis], the Edgar Filer Manual (EFM) states very clearly that if you don't provide the "Legal Entity [Axis]", the consolidated entity will be assumed or implied.

So what this means is that the abstract concept of the second representation "Document and Entity Information" is equivalent to the [Line Items] of the first representation "Document Information [Line Items]" in that they are both [Line Items] and all the report elements contained within each set of [Line Items] are Concepts as defined in the categorization above.

Bottom line is that everything within an SEC XBRL financial filing fits into the categorization of report elements whether a [Table] is explicitly provided or implied to exist.

Now moving on to the relations between the report element categories.

Recalling Figure 22 above which explains the relations between the different categories of report elements. There are two important points to remember. First, within the XBRL technical syntax there are three ways to express relations between report elements: presentation relations, calculation relations, and definition relations. When a relation is expressed using these three means, what is expressed needs to be consistently communicated by all three sets of relations. For example, the presentation relations cannot contradict what the definition relations are saying. That is what Figure 22 is communicating. For example, imagine saying one thing using the presentation relations and then saying something different using the definition relations? That would make no sense.

The second thing to understand is that there are intended rational and sensible relations. Likewise, there can be irrational and nonsensical relations which are not intended. This is worth explaining with a screen shot. Consider the screen shot below: (see http://goo.gl/1k07g)

If you look closely you will see that this SEC filer made a mistake. What the filer did was use a report element intended to be a [Member] as a Concept. You can see this from the name of the report

element and by the data type of the report element. Further, you can see that no value is shown in the rendering of the facts within that [Table]; all the cells in the rendering are empty. This makes no sense.

So the US GAAP Taxonomy Architecture states that certain relations are allowed and disallowed. It could be argued that it does not make this statement strongly enough. SEC EFM validation rules to not specifically enforce valid relations and disallow irrational and illogical relations, but that does not mean that EFM validation rules allow such relations either.

Another argument suggests that these relations exist: of all SEC XBRL financial filings 97.9% of all filers follow these rules and only 2.1% do not. This is information obtained from XBRL Cloud's Edgar Dashboard which provides verification services that assure SEC XBRL financial filings. See the column titled "Model Structure Rules (US GAAP Taxonomy Architecture)" on their EDGAR Dashboard (see https://edgardashboard.xbrlcloud.com/edgar-dashboard/#):

And so what are some of these model structure rules specified by the US GAAP Taxonomy Architecture which 97.9% of all SEC XBRL filings comply with? Here is a partial list of the types of model structure relations between the categories of report elements which are rational, sensible, and otherwise logical:

- Each [Table] MUST include at least one [Axis]. (i.e. it makes no sense to provide an explicit [Table] but then to provide no [Axis] for that [Table])

- Each [Table] MUST include exactly one set of [Line Items] (i.e. providing the [Line Items] of a [Table] is required.)

- Each [Table] MUST include only [Axis] or [Line Items] as children (i.e. it makes no sense for a [Table] to have a Concept as one of its children)

- Each [Axis] MUST only include [Member]s as children (i.e. a [Member] is a possible value for an [Axis], a Concept is not; therefore no Concept should ever exist as a child of an [Axis] in your representation of your digital financial report)

- Each [Axis] MUST only exist as a child of a [Table] (i.e. it makes no sense for an [Axis] to exist within a set of [Line Items])

- Members MUST only exist as a child of an [Axis], a child of a [Member] or a sibling of another [Member] (i.e. it makes no sense for a [Member] to exist within a set of [Line Items])

- Relations expressed via the XBRL presentation relations, the XBRL calculation relations, and the XBRL definition relations MUST consistently represent the same meaning (i.e. inconsistencies or contradictions between the three different ways to express XBRL relations make no sense)

So while this is not a comprehensive list of all the model structure rules articulated by the US GAAP Taxonomy Architecture, it does give you a pretty good idea that those rules are intended to achieve. Given the fact that 97.9% of all SEC XBRL financial filings follow these rules, these rules are rather difficult to dispute whether they are clearly defined by the US GAAP Taxonomy Architecture or the SEC EDGAR Filer Manual.