1. Financial Report Object Properties

This section describes the details of logical and physical implementation objects that are used within an XBRL-based digital financial report. Please refer to the logical model of a financial report\(^1\).

1.1. Details of logical objects and their properties

This section provides a more complete detailed explanation of the logical objects of a financial report, the relations between those logical objects, and the properties of those objects and relations.

Essentially, this looks at isolated rudimentary pieces of the overall model and focuses on the individual piece in detail.

**Logical Object / Discussion**

A **report set** has 1 or more reports. For example, when you compare the information of one reporting entity to the information of one or more other reporting entities; the report set is that complete set of reports being compared.

A **report** communicates facts.

A **fragment** is a set of fact sets which go together for some specific purpose.

A **fact set** is a set of facts which go together for some specific purpose within a report.

A **fact** is a single, observable, reportable piece of information. Facts have **characteristics**, a **fact value**, and they may have **parenthetical explanations** which further describe a fact.

**Characteristics** describe facts such that facts can be distinguished from one another.

Facts and characteristics organized within a fragment have an **information model**.

A **fact value** can be numeric or non-numeric. Numeric fact values have two additional properties of unit and rounding.

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**Graphical representation**

A report set has 1 or more reports. For example, when you compare the information of one reporting entity to the information of one or more other reporting entities; the report set is that complete set of reports being compared.

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A fragment is a set of fact sets which go together for some specific purpose.

A fact set is a set of facts which go together for some specific purpose within a report.

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Characteristics describe facts such that facts can be distinguished from one another.

Facts and characteristics organized within a fragment have an information model.

A fact value can be numeric or non-numeric. Numeric fact values have two additional properties of unit and rounding.

The **information model definition** says out the report elements that are used to construct the report model, the arrangement of aspects within that model, and the rules that are used to both describe the model and evaluate an instance of a report for consistency with the model.
Logical Object / Discussion

A fact is comprised of a set of aspects, a fact value, and an optional parenthetical explanation that is used to provide further descriptive information about a fact.

Graphical representation

A fact is a set of aspects, a fact value including the units and rounding properties which are used to describe a fact.

A complete report can be broken down into fragments. Fragments can further be broken down into logical fact sets. Fact sets contain facts.

For example, a balance sheet is a fragment of a report. The fact set that represents an assets roll up and the fact set that represents the liabilities and equity roll up combine to represent the balance sheet fragment.

The assets roll up fact set would contain the facts that represent assets such as total assets, current assets, cash and cash equivalents, inventories, and so forth.

Fact are combined into a fact set.

A Fact Set has an Information Model. An Information Model is a combination of a Concept Arrangement Pattern and a Member Arrangement Pattern for each Aspect other than the Concept. The following is an Information Model: (The Member Arrangement Pattern is circled in GREEN and the Concept is circled in RED.)
Logical Object / Discussion

Arrangement Pattern is circled in RED; note that the Member Arrangement Pattern for the Aspect Reporting Entity and Aspect Period are not shown because they are always flat lists and are defined by an XBRL instance not from within the XBRL taxonomy.

Rules guide, control, suggest, or influence behavior. Rules cause things to happen, prevent things from happening, or suggest that it might be a good idea if something did or did not happen. Rules help shape judgment, help make decisions, help evaluate, help shape behavior, and help reach conclusions.

A Report has structural Rules, mechanical Rules, logical Rules, mathematical Rules, consistency Rules, integrity Rules, and other such helpful Rules. (Common synonyms for Rule include Business Rule.)

The following are the Rules related to the Fact Set shown above. These Rules articulate a Roll Up relation between the Concepts represented in the Information Model above:

A Rendering is a human-readable presentation of the information provided within a Fact Set. A Rendering leverages the Information Model, the Rules, the Fact Set itself, ideas of a pivot table (slicers, etc.) known common practices, and any other information provided by a software application to provide a static or dynamic human-readable presentation of the represented information. For example, this is a Rendering:
1.2. **Implementation objects and their properties**

The following is a summary of the implementation objects and their properties including a graphical depiction of each object.

<table>
<thead>
<tr>
<th>Implementation Details</th>
<th>Graphical representation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Report</strong>: Financial reports communicate facts.</td>
<td><img src="image" alt="Graphical representation" /></td>
</tr>
<tr>
<td>A financial report is implemented as an XBRL instance and supporting XBRL taxonomies. The distinction between instance and taxonomy is a nature of XBRL, not a nature of a financial report.</td>
<td></td>
</tr>
</tbody>
</table>
**Fragment**: A fragment is a set of one or more fact sets.

A fragment is implemented as a network/table. Neither the US GAAP Taxonomy architecture nor the SEC defines precisely what a “network” or “table” is semantically. This is a notion rather than a physical thing.

**Component**: A component is a set of facts that exist within a Network + a [Table], whether that [Table] is explicitly provide or implied.

A component is implemented as a network/table. Neither the US GAAP Taxonomy architecture nor the SEC defines precisely what a “network” or “table” is semantically.

**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 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.

Facts are implemented as XBRL simple facts. Compound facts (i.e. tuples) are not allowed per the US GAAP Taxonomy Architecture.

**Fact Value**: Facts have a value.
Parenthetical explanations: Financial facts have parenthetical explanations which provide additional descriptive information about the fact. Parenthetical explanations are implemented as XBRL footnotes.

Characteristics: Facts have characteristics (common synonym for characteristic is aspect, dimension, or [Axis]). Characteristics describe facts. Characteristics are implemented using several different technical syntax in XBRL; as axes (i.e. set of [Axis]), [Member]s, [Line Items]; reporting entity and period are part of the XBRL instance context element technical syntax, but these are clearly axis.

Relations: Relations have properties. A relation is between two report elements. A relation has a role.
**Reporting entity**: Reporting Entity is in essence a type of [Axis], just implemented as a different technical syntax in XBRL.

**Period**: Period is in essence a type of [Axis], just implemented using a different technical syntax in XBRL.

**Concept arrangement pattern**
**Member arrangement pattern**

**Rules** guide, control, suggest, or influence behavior. Rules cause things to happen, prevent things from happening, or suggest that it might be a good idea if something did or did not happen. Rules help shape judgment, help make decisions, help evaluate, help shape behavior, and help reach conclusions.

Some rules relate to the overall report such as consistency rules that make sure there are no inconsistencies or contradictions in report information.

Other rules relate to each specific fact set, enforcing the integrity of each individual fact set.

Rules are implemented using XBRL Formula and XBRL definition relations.

**Label:** Implementation of labels tends to be straightforward.
1.3. Implementation of report elements

Report elements are defined as elements that make up the structure of a fragment of a report. Report elements can be grouped into the following categories: Network, Table (or Hypercube), Axis (or Dimension), Member, Line Items (or Primary Items), Concept, and Abstract.

Report elements can be related to one another in specific ways. The following table describes the allowed and disallowed between the different categories of report elements:
The following table describes each report element and provides a graphical representation of the relations between the different objects that make up a report element.

### Implementation Details

**Network:** Semantics of a network are undefined.

Networks are implemented as XBRL networks.

**Table:** Semantics of what a table represents are undefined.

**HINT:** While the semantics of what a [Table] represents are clearly defined from a report logical model perspective, they are undefined from a domain perspective.

Tables are implemented either explicitly as a [Table] or XBRL Dimensions hypercube or implicitly (i.e. if concepts are not associated with a hypercube) as the relations within a network.

Said another way, the core aspects reporting entity characteristic, period characteristic, and concept characteristic are required; XBRL Dimensions can be used to create additional noncore characteristics.
Axis: An [Axis] is used to articulate a characteristic. (Axis, characteristic, and aspect are all synonyms)

An [Axis] is abstract and therefore can never contain a value. Therefore the data type, period type, and balance have no logical meaning. SEC EFM requires specific values for these attributes.

There are multiple ways characteristics are implemented: as an [Axis], as a context entity identifier, and as a context period.

Member: A [Member] is a possible value of an [Axis]; together they are used to articulate a characteristic.

A [Member] is abstract and therefore can never contain a value. Therefore the data type, period type, and balance have no semantic meaning. SEC EFM requires specific values for these attributes.

HINT: Use of the term [Domain] to represent the root member of a set of members should be avoided unless it is required for a specific reporting profile.

Line Items: [Line Items] which are abstract can never contain a value. Therefore the data type, period type, and balance have no semantic meaning. SEC EFM requires specific values for these attributes.

HINT: Abstract report elements are implemented similar to concepts, but have an attribute "abstract" whose value is "true". Note that the term "abstract" is not being used here to mean the value of the XML Schema abstract attribute.
**Concepts**: Concepts describe facts in such a way that they can contain values. As such, concepts therefore have a data type, period type, balance type are important.

Concepts are implemented as (a) XBRL Dimensions primary items if they participate in a hypercube or if they do not participate in a hypercube (b) XBRL concepts.

**Abstract**: Abstracts are concepts that can never contain a value or exist in an XBRL instance. Therefore the data type, period type, and balance have no logical meaning.

**HINT**: Abstract report elements are implemented similar to concepts, but have an XML attribute "abstract" whose value is "true". Note that the term "abstract" is not being used here to mean the value of the XML Schema abstract attribute.

### 1.4. Implementation of concept arrangement patterns

A concept arrangement pattern is simply the arrangement of concept within the Concept aspect whether that set of concepts is defined within an explicit table or whether the concepts are defined within an implied table. The following graphic shows the information model of a Fact Set. The concept arrangement pattern is circled in RED. The member arrangement patterns are circled in GREEN.

<table>
<thead>
<tr>
<th>#</th>
<th>Label</th>
<th>Report Element Class</th>
<th>Period Type</th>
<th>Balance</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Inventory, by Component [Table]</td>
<td>[Table]</td>
<td></td>
<td></td>
<td>gaapInventoryByComponentTable</td>
</tr>
<tr>
<td>2</td>
<td>Legal Entity [Axis]</td>
<td>[Axis]</td>
<td></td>
<td></td>
<td>frm:LegalEntityAxis</td>
</tr>
<tr>
<td>3</td>
<td>Consolidated Entity [Member]</td>
<td>[Member]</td>
<td></td>
<td></td>
<td>frm:ConsolidatedEntityMember</td>
</tr>
<tr>
<td>4</td>
<td>Inventory, by Component [Line Items]</td>
<td>[Line Items]</td>
<td></td>
<td></td>
<td>gaapInventoryByComponentLineItems</td>
</tr>
<tr>
<td>5</td>
<td>Inventory, by Component [Roll Up]</td>
<td>[Abstract]</td>
<td></td>
<td></td>
<td>gaapInventoryByComponentRollUp</td>
</tr>
<tr>
<td>6</td>
<td>Finished Goods</td>
<td>[Concept] Monetary</td>
<td>As Of</td>
<td>Debit</td>
<td>gaapFinishedGoods</td>
</tr>
<tr>
<td>7</td>
<td>Work in Progress</td>
<td>[Concept] Monetary</td>
<td>As Of</td>
<td>Debit</td>
<td>gaapWorkInProgress</td>
</tr>
<tr>
<td>8</td>
<td>Raw Material</td>
<td>[Concept] Monetary</td>
<td>As Of</td>
<td>Debit</td>
<td>gaapRawMaterial</td>
</tr>
<tr>
<td>9</td>
<td>Inventory</td>
<td>[Concept] Monetary</td>
<td>As Of</td>
<td>Debit</td>
<td>gaapInventory</td>
</tr>
</tbody>
</table>
The following table describes each report element and provides a graphical representation of the relations between the different objects that make up a report element.

<table>
<thead>
<tr>
<th>Implementation Details</th>
<th>Graphical representation</th>
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</table>
| **Set:** | A Set is a type of concept arrangement pattern where concepts have no described mathematical relations.  
**HINT:** An older synonym for Set is Hierarchy. The term Hierarchy is deprecated because essentially all concept arrangement patterns are hierarchies.  
If facts need to be reported but they do not fit into one of the other patterns described below; the facts can always be represented as a Set. You may not be able to represent the relations, but you can always represent the facts. |
| **Roll Up:** | A Roll Up is a type of concept arrangement pattern which represents a basic roll up type mathematical relationship: Fact A + Fact B + Fact C = Fact D (a set of items and a total).  
**HINT:** Roll Up relations are always easily distinguishable because XBRL calculation relations exist to represent the roll up mathematical business rules.  
A roll up has exactly one total. A roll up can be a nested set of roll ups such as an income statement. |
| **Roll Forward:** | A Roll Forward is a type of concept arrangement pattern which represents a basic roll forward mathematical relation: Beginning balance (stock) + changes (flow) = Ending balance (stock)  
**HINT:** Synonyms for roll forward include movement analysis, reconciliation, change analysis.  
Roll forward relations cannot be represented using XBRL calculations; XBRL Formula must be used. |
| **Adjustment:** | An adjustment is a type of concept arrangement pattern which represents a basic reconciliation between an originally stated value and a restated value usually due to a correction or error: Originally stated balance + adjustments = |

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restated balance.

Adjustment relations cannot be represented using XBRL calculations; XBRL Formula must be used.

**Variance:** A variance is a type of concept arrangement pattern which represents a mathematical difference between two reporting scenarios: Amount (actual scenario) – Amount (projected scenario) = variance.

Variance relations cannot be represented using XBRL calculations; XBRL Formula must be used.

**Roll Forward Info:** A roll forward info is a type of concept arrangement pattern which represents a non-mathematical relation of information about a roll forward type relation.

**HINT:** If you represent a roll forward info, you probably also represented a roll forward that has the information that the roll forward info is describing.

**Text Block:** A text block is a type of concept arrangement pattern which represents a non-mathematical relationship in the form of prose.

**HINT:** A text block is escaped XHTML and lets you represent a list, a paragraph, an entire table of information, etc.

**Complex Computation:** A complex computation is a type of concept arrangement pattern which represents any arbitrary mathematical relationship between a set of numeric facts.

**HINT:** A complex computation essentially represents some set of numeric facts and then XBRL.
1.5. **Implementation of member arrangement patterns**

A member arrangement pattern is simply the arrangement of concept within any Aspect other than the Concept aspect. The concept arrangement pattern is circled in RED. The member arrangement patterns are circled in GREEN.

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<td>gaap:Inventory</td>
</tr>
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</table>

**Implementation Details**

**Member aggregation:** A Member Aggregation is a type of member arrangement pattern which represents a basic roll up type mathematical relationship: Fact A + Fact B + Fact C = Fact D (a set of items and a total).

**HINT:** Note that the member aggregation and the roll up are logically identical.

If facts need to be reported but they do not fit into one of the other patterns described below; the facts can always be represented as a Set. You may not be able to represent the relations, but you can always represent the facts.

**Member non-aggregation:** A Member non-aggregation is a type of member arrangement pattern where concepts have no described mathematical relations; some aspect is provided specifically to distinguish one fact from another fact that both use the same concept.