Consolidation levels of financial statements: Options according to XBRL dimensional characteristics and filing rules

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Abstract. The financial statements of a group of companies may be prepared according to different consolidation levels. The accounting standards IAS 27 (Consolidated and Separate Financial Statements, 2008) and IFRS 10 (Consolidated Financial Statements, 2011) as well as other GAAP and Regulatory Frameworks are applicable, thus creating different consolidated financial statements with different facts inside. This discussion is related to approaches, including information referenced to the consolidation level when using the Data Point Methodology into XBRL instance documents. The approaches are also affected by (1) the uniqueness of Entity identification (xbrli:identifier) as a hard coded(1) XBRL dimension and (2) the diversity of different Supervisory Filing Rules restricting to a single Entity the information included in a single XBRL Instance Document. "All xbrli:identifier elements in an instance must have identical content". The authors illustrate the main structural characteristics of a Financial Statement, its modelling as Data Points and XBRL Instance Documents, within the scope of this paper. The conclusions are (1) the creation of a consolidated Financial Statement requires, in general, some human intervention (2) the structure of a consolidated Financial Statement can basically be reused from its non-consolidated Financial Statements (3) the consolidation level is invariable across the entire instance document. In a practical approach, for European Regulatory Financial Frameworks, the conclusions are (4) the Entity identification should not be a part of Data Points and (5) the definition of Entity as hard-coded Dimension creates redundancy and verbosity in XBRL, in the opinion of the authors.

Keywords:
Data Point Model (DPM), eXtensible Business Reporting Language (XBRL), Multidimensional Data Model (MDM), Consolidation levels, Financial Statements.

[1] In the IT jargon, the expression *hard-coded* is synonymous with *wired* or, in certain mode, *privileged*, denoting that particular specific characteristics of the artefact are specifically included into the code, at developing time, lacking of parameters or other modifiable expressions that can be adapted to the circumstances in run time. The maintenance and evolution of hard-coded solutions are particularly challenging. The expression *hard coded* comes from the initial IT pioneers when using hardware circuits instead of software routines for solving certain functions.

1. Introduction to consolidation of Financial Statements

The empirical starting point is that a Corporation usually is, in legal terms, a number of Companies with a schema of control. In addition to the financial statements of each one of the Companies, the Supervisor also is usually interested in the financial statements of the Corporation as a whole, or by different consolidation levels (geographic, sector….) as it is illustrated in figure 1.

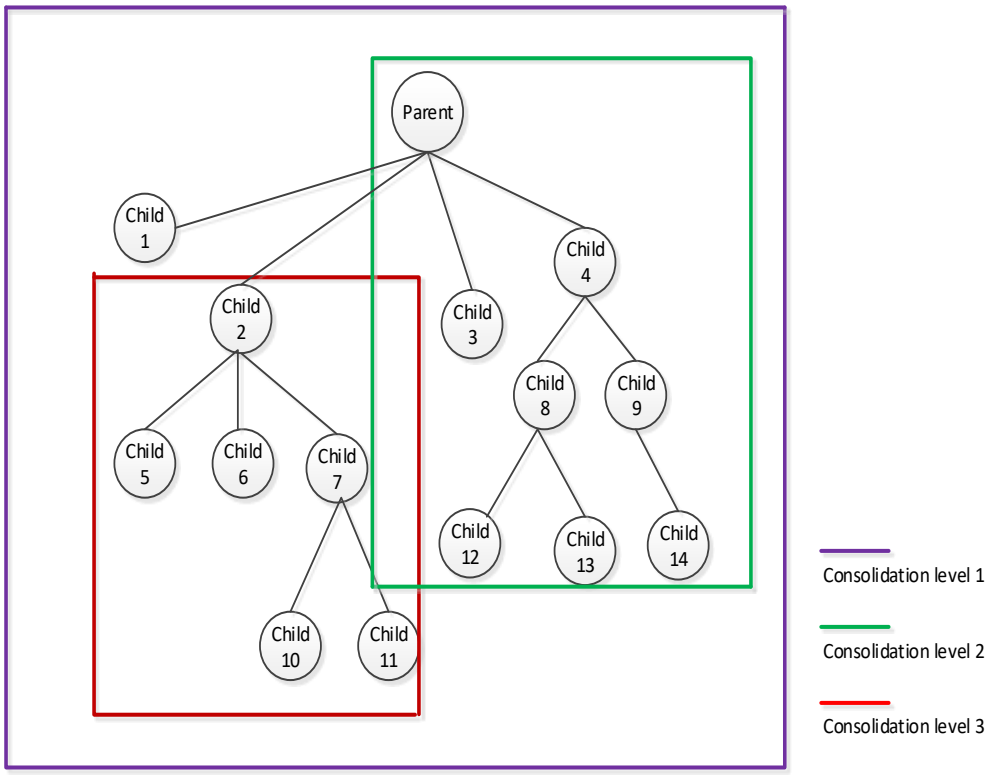

Figure 1. Hierarchy of Consolidation Levels. (Wagener, 2017)

There are practical difficulties when consolidating two or more Companies. In the example (figure 2), the entity British Petroleum (BP) PLC (UK) and British Petroleum (BP) Pensions (Overseas) Limited (Guernsey) are in different fiscal jurisdictions.

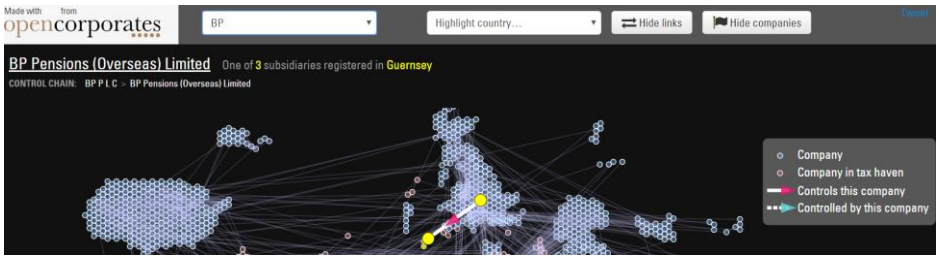

Figure 2. Capture of www.opencorporates.org/viz/financial for BP

For a large Corporation, the web of subsidiaries seems to be quite complex (figure 3):

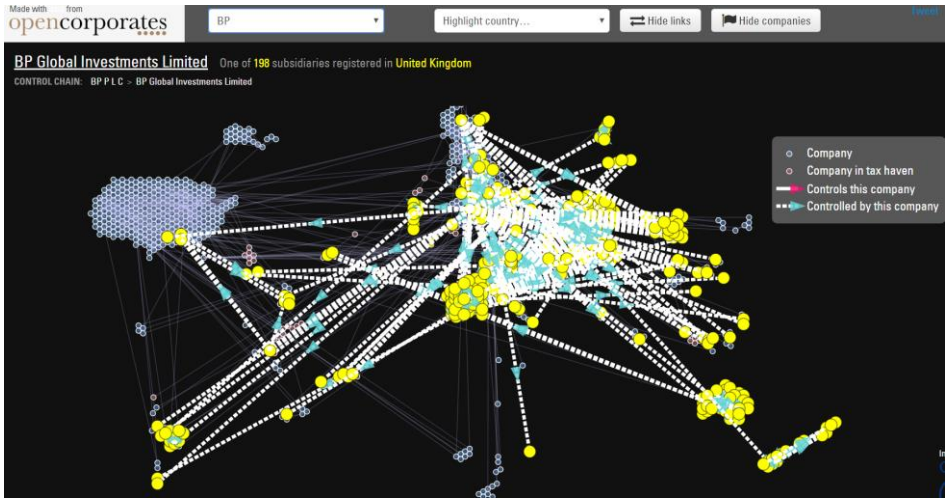

Figure 3. Capture of www.opencorporates.org/viz/financial for BP

The consolidation process depends on the applicable Accounting Principles. In the case of IFRS, the initial IAS 27 Consolidated and Separate Financial Statements (2008) has been superseded by IAS 27 Separate Financial Statements and IFRS 10 Consolidated Financial Statements, in constant evolution (2008, 2010, 2011, 2012, 2014, and 2015). Different GAAP frameworks also have different consolidation rules.

In some drafts of the European Banking Authority, there are about 23 Consolidation typologies (figure 4).

	Scope of consolidation		Entity Properties			
Categories of Reporting Entities	Consolidation criteria	Geographic scope	Structure	Line of business	Origin	Residence
Group of Deposit bank	Group of deposit bank	All	Conventional group	Deposit bank	Domestic	Resident
Consolidation group of Deposit bank	Consolidation group of Deposit bank	All	Consolidation group	Deposit bank	Domestic	Resident
Group of Financing institution	Group of Financing institution	All	Conventional group	Financing institution	Domestic	Resident
Consolidation group of Financing institution	Consolidation group of Financing institution	All	Consolidation group	Financing institution	Domestic	Resident
Group of central body	Group of central body	All	Conventional group	Central body	Domestic	Resident
Financial conglomerate	Financial conglomerate	All	Conventional group	Financial conglomerate	Domestic	Resident
Group of amalgamation	Group of amalgamation	All	Consolidation group	Group of amalgamation	Domestic	Resident

Figure 4 Consolidation Levels, excerpt of a circulating draft

The consolidation process is basically the aggregation of the figures of each tag of the Financial Statements of the companies to be consolidated. As an initial approach, in the example of Companies A and B, Consolidated Assets (A+B) should be equal to Assets Company A plus Assets Company B.

However, if Company A (creditor) had provided a credit to Company B (debtor) of 100 €, this amount should disappear in the consolidation. The Asset of 100 € in Company A is to be compensated with the Liability of 100 € in Company B, thus the amount of 100 € is cancelled out in the Consolidation.

In most cases, the level of disaggregation for intra-group compensations is more granular than the disclosures of the financial statements of the Companies under consideration. The disaggregated information required for intra-group compensations is not necessarily disclosed in the financial statements. Consequently, it is required to use information not disclosed in the financial statements to perform the consolidation.

Many other rules about cross-participations apply. For example, a Company may not be 100% owned by other company; therefore, the consolidation is not necessarily at 100%.

Therefore, a human accountant should check the cross-participations among the Companies included in the Consolidation Level perimeter and consolidate the amounts according to the applicable Accounting Principles.

In conclusion, we can summarize that, in practical terms, there is no practical way to generate a consolidated financial statement using exclusively the respective solo (un-consolidated) financial statements of a group of companies.

However, there is something that they may have in common: the structure of the financial statements:

In a specific Jurisdiction, all companies must prepare their financial statements according to a single GAAP or Regulatory Framework. Even if the group of companies is widespread across the globe, the financial statements may be prepared according to IFRS or to the GAAP required by the Group. To consolidate based on completely different structures of financial statements, without a common core, is out of scope for this paper.

The consolidated financial statement may generate additional details (i.e., details about intra-group compensations). Nevertheless, the structure of the financial statements is the same for the Group and for each company.

2. Container for Financial Statements

MAXIDRIVE CORP.
Balance Sheet
At December 31, 2009
(in thousands of dollars)

Assets	
Cash	$ 4,895
Accounts receivable	5,714
Inventories	8,517
Plant and equipment	7,154
Land	981
Total assets	$27,261
Liabilities	
Accounts payable	$ 7,156
Notes payable	9,000
Total liabilities	16,156
Stockholders' Equity	
Contributed capital	2,000
Retained earnings	9,105
Total stockholders' equity	11,105
Total liabilities and stockholders' equity	$27,261

Figure 5 Example of Balance Sheet Libby, 2009)

This basic example of a balance sheet is prepared as a Header and a Body (figure 5). The header identifies the Entity (MaxiDrive), the type of financial statement (Balance Sheet), the period (fiscal year 2009 ending at December 31) and meaning of the figures (x1,000$). The body has two columns: Tags and Facts. Each Tag provides (in English) the semantic context for its corresponding numeric Fact. There are also some evident relationships. For instance, Assets must be equal to Liabilities plus equity.

The use of structured containers for Financial Statements becomes much more relevant when the number of tags is several orders of magnitude larger. For instance, if the inventories are disaggregated by the Cartesian combination of 100 countries, 200 products, 15 sizes and 10 colours, the total number of possible tags will be 100 x 200 x 15 x 10 = 3.000.000 enumerated tags.

The traditional matrix notation minimizes the problem by using sub-indexes, in this case with the notation $Inventory_{Country,Product,Colour,Size}$. In this paper, a Financial Statement is structured as a Header plus a list of Tags (with and without sub-indexes).

Roughly speaking, an XBRL Instance Document is quite similar, but using XML syntax instead of paper and plain English. Each Tag (also known as a Primary Item) is contextualized belonging to a Header (Entity and Period) and having zero, one or more than one disaggregation (known as Dimensions according to the Multidimensional Data Model, MDM).

3. Data Point Modelling justification, definition and properties

3.1. Justification for the development of the DPM

The Data Point Model goes back to when the IT experts started to define XBRL Taxonomies (models) for large Financial Statements, such as Supervisory Reports, at which time a serious challenge was detected in the modelling process.

The Supervisory Reporting Frameworks are defined by domain experts, using general bi-dimensional Excel Spreadsheets. The experts collapse all the dimensions in the real life model into the only the two dimensions available in a plain spreadsheet (axis X and Y). The remaining dimensions (usually known as axis Z) are described in the most imaginative places, such as headers, footnotes, explanatory notes or guidelines, or even hundreds of pages away, or in different documents.

When the IT experts deconstruct the Reporting Spreadsheet, they are presented serious challenges to figure out which dimensions are actually applicable to each particular cell. The physical proximity of two cells may also create some confusion, as their respective axis Z may be very different from each other.

In a series of successive refinements, the Data Pont Methodology was established in the context of the Eurofiling Community as a help in modelling large Supervisory Reports and, by extension, containers for Financial Statements. (Diaz, 2012)

In this paper, **DPM** and **XBRL Instance Documents** are used to define containers for Facts (actual amounts) of a Financial Statements.

3.2. Definitions of DPM artefacts for this paper:

Member as a defined value, with an associated meaning. Examples: Belgium, Bag, Large, Red

Dimension as a list of one or more unordered, dissimilar Members, with an associated meaning. Examples: European Country (Belgium, France, Italy….), Product (Bag, Box, Wallet…), Size (Large, Small), Colour (Red…). Two different Dimensions may share one or more Members.

Dimension-Member is each occurrence of a particular Member in a particular Dimension

Data Point is a container that can store one and only one Fact, **identified** by a set of one or more unordered and unique Dimension-Members each one belonging to a unique (dissimilar) Dimension. The list of Dimension-Members identifying the Data Point gives the semantic context of the Fact.

Data Point Model $\boldsymbol{DPM}$ is an array of unordered and unique elements defined as Data Points DP_p where $p = 1 \ldots n$ being n the number of different Data Points (cardinality of the DPM) where $DP_i \neq DP_j$, $\forall i, j \in p \; and \; i \neq j$..

3.3. Properties of DPM artefacts:

The Cartesian product of all the Dimensions with its respective Members defines the **Dimensional-Member space** of a Data Point Model

As usually only a small fraction of the possible Data Points in the dimensional space of the Data Point Model is actually defined, a Data Point Model is basically a **Sparse Matrix**.

A unique Dimension existing in each Data Point Model, usually know as ***Metrics***, is singular. Each Member of the Dimension *Metrics* provides some Metrics-Member invariable characteristics of the Fact contained in the Data Point where this Metrics-Member appears. For instance, it defines if the Fact is a Text or an Amount.

In relation to the Balance Sheet of Figure 5, each Tag would be defined as a one-dimensional DPM, with a single Metrics-Member Dimension, i.e. (Metrics-Cash $ 4895), (Metrics-Land $ 981) and so on.

However, in theory (as no known real framework has yet been applied in practice), the same Balance Sheet of Figure 5 would be expressed as a bi-dimensional DPM, with a Dimension Metrics of a single element Metrics-Amount, and a second Dimension equivalent to Tag, as Tag-Cash, Tag-Land and so on. In this case, the expressions might be (Metrics-Amount, Tag-Cash $ 4895), (Metrics-Amount, Tag-Land $ 981) and so on. How many and with which characteristics the Dimensions should be defined in a particular case, is still a matter of subjectivity.

Nobody's perfect (Some Like It Hot, Jack Lemmon, 1959)

4. Data Point Model comparability and extensibility

As the order of the Dimension-Members identifying a Data Point is irrelevant, two Data-Points belonging to different DPMs with the same set of Dimension-Members are **identical**, sharing the same semantics, and being **comparable** between them; hence, having the extensionality (extensional equality) property.

Two DPMs may share a common set of Dimension-Members. A Data Point P defined in DPM A is **identical** to a Data Point Q defined in DPM B if sharing the same **identification** as a set of Dimension-Members.

Facts expressed according to **identical** Data Points share the same semantics, and therefore are **comparable** among them.

A DPM is **extensible/reducible** by

A. Adding/subtracting Data Points

   I. Defining new (or eliminating old) Data Points with existing Dimensions-Members. All the Data Points in the original DPM are **identical** to the same Data Points in the extended DPM, and those Data Points are **comparable**. The original and the extended DPMs share the same **Dimensional-Member space**, simplifying IT implementations.

   II. Defining new Data Points with new (and optionally existing) Dimensions-Members. All the Data Points in the original DPM are **identical** to the same Data Points in the extended DPM, and those Data Points are **comparable**. The original and the extended DPMs do not share the same Dimensional-Member space, affecting IT implementations.

B. Adding/subtracting Dimension-Members to existing Data Points.

   III. Redefining existing Data Points by adding (or subtracting) existing Dimensions-Members. The redefined Data Points in the original DPM are **not identical** to the same Data Points in the extended DPM, and those Data Points are **not comparable**. The original and the extended DPMs share the same **Dimensional-Member space**, simplifying IT implementations.

   IV. Redefining existing Data Points by adding new (and optionally adding or subtracting existing) Dimensions-Members. The redefined Data Points in the original DPM are **not identical** to the same Data Points in the extended DPM, and those Data Points are **not comparable**. The original and the extended DPMs share the same **Dimensional-Member space**, affecting IT implementations.

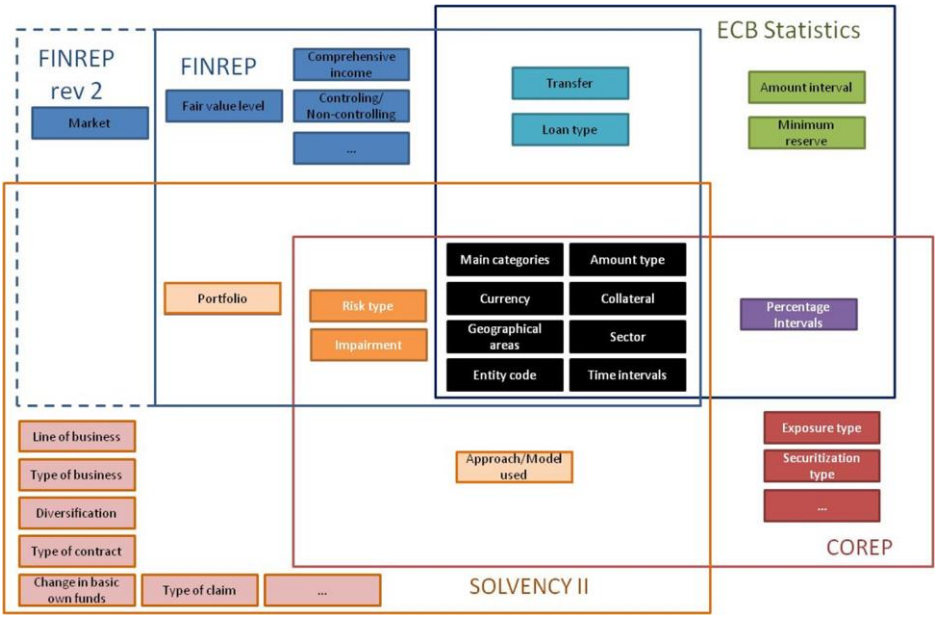

Figure 6 Shared Dimensions in European Reporting Frameworks. BR-AG, around 2011

The figure 6 represents the shared dimensions of the most relevant European Supervisory Frameworks. The actual amounts in each fact may be different, principally due to the different Supervisory perspectives, which usually requires the use of different metrics. However, its comparability and implementation would be largely facilitated by using dimensions shared in common.

5. Consolidating Financial Statements

From the introduction section, it is possible to obtain the next rule: If we have the financial statements S of the entities 1 and 2, i.e. S_1 and S_2, let $\mathbb{C}_c$ be a consolidation level, $\forall c = 1 \ldots m$, then $S_1 \mathbb{C}_c S_2 \neq S_1 \oplus S_2$ where $\oplus$ is a simple operation of addition.

In the scope of the Data Point Modelling (DPM), it is possible to define a financial statement of a particular Entity e as a finite list (array) $\forall p = 1 \ldots n$ of facts (values) $F_{e,p}$ being the semantics of each fact described by its respective Data Point DP_p as expressed into the Data Point Model DPM. Hence, each Data Point DP_p in the financial statement of the Entity e contains a single fact $F_{e,p}$

The consolidation of the financial statements of a number of entities, according to a particular type consolidation level $\mathbb{C}$ and a Data Point Model DPM is not expressible as a summation.

$F_{j+1,p} \neq \sum_{e=1}^{j} F_{e,p} \quad \forall p = 1 \ldots n$ being the lists $1..j$ (list of entities) and $1..p$ (DPM used) where each $p \rightarrow$ one $\mathbb{C}$ (consolidation level)
In general, it is not possible to define (in practical terms) a consolidation function such as $F_{j+1,p} = f(F_{1,p} \ldots F_{j,p}) \ \forall p = 1 \ldots n$ for $\mathbb{C}$

Corollary: The consolidated financial statement defined by the consolidation level $\mathbb{C}$ of a list of Entities $1..j$ is not obtainable by an automatic process.

6. Entity identification in DPM and XBRL

The information in the Header (as Entity or Period), that applies to all and each one of the Data Points, may be part of the Data Point or may be considered metadata about each particular instantiation of the DPM.

In this paper, an XBRL Instance Document is defined as an XML expression of a particular set of Facts contained in the instantiation of a Data Point Model, following the rules of the XBRL Standard. In XBRL, Entity and Period are managed in a different way from the Dimensions.

```
<xbrli:context id="_ctx326">
  <xbrli:entity>
     <xbrli:identifier scheme="http://void">MAXDRIVE CORP.</xbrli:identifier></xbrli:entity>
  <xbrli:period><xbrli:instant>2009-12-31</xbrli:instant></xbrli:period>
   <xbrli:scenario> <xbrldi:explicitMember
      dimension="ifrs:FairValueAsDeemedCostAxis">ifrs:PreviousGAAPMember</xbrldi:explicitMember>
   </xbrli:scenario>
</xbrli:context>
<ifrs:PropertyPlantAndEquipmentFairValueUsedAsDeemedCost decimals="0" unitRef="USD"
contextRef="_ctx326">792445</ifrs:PropertyPlantAndEquipmentFairValueUsedAsDeemedCost>
```

In this example, for the Entity MAXDRIVE CORP. for the date 2009-12-31, the Fact 792445 USD is the value for the Metrics (Tag) ifrs:PropertyPlantAndEquipmentFairValueUsedAsDeemedCost with the Dimension ifrs:FairValueAsDeemedCostAxis and the Member ifrs:PreviousGAAPMember

Each dimension member in the XBRL Instance Document is unambiguously correlated with a Dimension–Member in the DPM, and the Tag in the XBRL Instance Document is unambiguously correlated with a Dimensional Metrics–Member in the DPM.

Hence, the operations applicable to a DPM are easily translated to the corresponding XBRL Instance Document, with the DPM acting as an abstraction layer of the XBRL

7. Identifying Consolidated Financial Statements

Typically, an Entity is the "head" of the whole group. The tendency is to use the identification of the header Entity, plus an indication of the Consolidation level. In Figures 2 and 3, the company BP PLC seems to be the head of the whole British Petroleum group of companies.
The number and definition of consolidation levels is prescribed by the Supervisors, Authorities and even by the Board for Stakeholders (i.e., in low-level terms, arbitrary and changing over the time).

There are several options to add the Consolidation Level to a Financial Statement, with different pros and cons. The following options are defined for XBRL Instance Documents when using the Data Point Modelling.

As a first cut, the Consolidation Level would be included either in each Fact (as the Entity identification is included) or only once in the XBRL taxonomy (as the filing Indicators are included).

Even if all is technologically possible, the cost of each approach should be commensurate with the cost/benefits of alternative approaches, as described below.

7.1. Include Consolidation Level in each Fact

Each Fact in an XBRL Taxonomy belongs to a single Context. The context contains (optionally) Explicit Dimensions, Typed Dimensions and (mandatorily) Entity Name, Entity Schema and Period.

The Period, in the opinion of the authors, should be discarded as a container of Consolidation Level information, as the temporal characteristics of the Fact have no relation at all with the Consolidation level.

Consequently, four options remain belonging to two basic approaches: include a Consolidation Level as a **new Dimension** or include Consolidation Level as **part of the Entity**.

Include a **new Dimension** in each Fact creates problems of DPM comparability. Each dimension member in the XBRL Instance Document is unequivocally related to a Dimension-Member in the DPM. As described in Chapter 4.- Data Point Model comparability and extensibility, adding a new Dimension-Member to a Data Point creates comparability issues.

The two main options for the Dimensional approach is the use of Explicit Dimensions (having an enumerated list of Members defined in the Taxonomy) or generic Typed dimensions (the Members are not defined in the Taxonomy, only the syntactical rules of formation).

7.2. Consolidation Level as an Explicit Dimension in each Fact

```
<xbrli:context id="c1317">
  <xbrli:entity><xbrli:identifier
scheme="http://standards.iso.org/iso/17442">DUMMY_LEI</xbrli:identifier></xbrli:entity>
  <xbrli:period><xbrli:instant>2018-03-31</xbrli:instant></xbrli:period>
  <xbrli:scenario>
    <xbrldi:explicitMember dimension="eba_dim:BAS">eba_BA:x17</xbrldi:explicitMember>
    <xbrldi:explicitMember dimension="eba_dim:MCY">eba_MC:x465</xbrldi:explicitMember>
    <xbrldi:explicitMember dimension="eba_dim:CNL">eba_CN:x111</xbrldi:explicitMember>
  </xbrli:scenario>
</xbrli:context>
<eba_met:mi290 unitRef="uGBP" decimals="-3" contextRef="c1317">8897000</eba_met:mi290>
```

In this example, the added line (in red) is an explicit dimension.
The meaning might be translated as

- eba_dim:CNL = Dimension Consolidation Level
- eba_CN:x111 = Type of Consolidation Level = 111, i.e. Financial subsidiaries in Europe

The explicit dimensions are defined in the taxonomy, and each typed dimension has a list of members defined in the taxonomy. Each change in an explicit dimension or explicit dimension member forces a change in the taxonomy. Explicit members would be easily used in Formulas and XBRL processors

A variant is an Explicit Dimension, with members defined but unused. If a new Consolidation Level is required, simply an unused member is chosen and conventionally assigned in the guidance documents (out of XBRL scope) as semantically equivalent to the new Consolidation Level.

7.3. Consolidation Level as a Typed Dimension in each Fact

```
<xbrli:context id="c1317">
  <xbrli:entity><xbrli:identifier
scheme="http://standards.iso.org/iso/17442">DUMMY_LEI</xbrli:identifier></xbrli:entity>
  <xbrli:period><xbrli:instant>2018-03-31</xbrli:instant></xbrli:period>
  <xbrli:scenario>
    <xbrldi:explicitMember dimension="eba_dim:BAS">eba_BA:x17</xbrldi:explicitMember>
    <xbrldi:explicitMember dimension="eba_dim:MCY">eba_MC:x465</xbrldi:explicitMember>
    <xbrldi:typedMember
dimension="eba_dim:CNL"><eba_typ:CN>111</eba_typ:CN></xbrldi:typedMember>
  </xbrli:scenario>
</xbrli:context>
<eba_met:mi290 unitRef="uGBP" decimals="-3" contextRef="c1317">8897000</eba_met:mi290>
```

In this example, the added line (in red) is a typed dimension. The meaning would be translated as

- eba_dim:CON = Dimension Consolidation Level
- eba_CN = Definition of Member of Consolidation Level
- 111= Type of Consolidation Level, i.e. Financial subsidiaries in Europe
- The typed dimensions are defined in the taxonomy, and each typed dimension does NOT have a list of members, only an (optional) pattern to detect poorly formatted members.

Each change in a typed dimension or in a pattern forces a change in the taxonomy. However, as the members are not defined in the taxonomy, new members may be used as best convenient.

Consolidation Levels can be created at any time. Typed members would be also used in Formulas and XBRL processors.

7.4. Consolidation Level as part of the Entity Name in each Fact

```
<xbrli:context id="c1317">
  <xbrli:entity><xbrli:identifier
scheme="http://standards.iso.org/iso/17442">DUMMY_LEI_CN111</xbrli:identifier></xbrli:entity>
  <xbrli:period><xbrli:instant>2018-03-31</xbrli:instant></xbrli:period>
  <xbrli:scenario>
    <xbrldi:explicitMember dimension="eba_dim:BAS">eba_BA:x17</xbrldi:explicitMember>
    <xbrldi:explicitMember dimension="eba_dim:MCY">eba_MC:x465</xbrldi:explicitMember>
  </xbrli:scenario>
</xbrli:context>
<eba_met:mi290 unitRef="uGBP" decimals="-3" contextRef="c1317">8897000</eba_met:mi290>
```

This mechanism overloads the Entity name (i.e. LEI of the Entity) with the Consolidation Level. This would add complexity when validating Entity identification. Overloading Entity name with the consolidation level would be used with some difficulty in Formulas and XBRL processors

7.5. Consolidation Level as part of the Entity Schema in each Fact

```
<xbrli:context id="c1317">
  <xbrli:entity><xbrli:identifier scheme="http://consolidation.level/CN111">DUMMY_LEI
</xbrli:identifier></xbrli:entity>
  <xbrli:period><xbrli:instant>2018-03-31</xbrli:instant></xbrli:period>
  <xbrli:scenario>
    <xbrldi:explicitMember dimension="eba_dim:BAS">eba_BA:x17</xbrldi:explicitMember>
    <xbrldi:explicitMember dimension="eba_dim:MCY">eba_MC:x465</xbrldi:explicitMember>
  </xbrli:scenario>
</xbrli:context>
<eba_met:mi290 unitRef="uGBP" decimals="-3" contextRef="c1317">8897000</eba_met:mi290>
```

This mechanism overloads the Entity schema (i.e., schema defining the name) with the Consolidation Level.

The schema specified in the CEN vs XBRL, and used in EBA filing Rules, is, as defined in RFC5141, by using the URL of ISO followed by the Code, as: LEI -> http://standard.iso.org/iso/17442/{LEI code}

However, the schema has no practical use, and the RFC5141 is a convention that can be easily changed, if required.

Simply, the RFC5141 is not followed anymore, but this would not add complexity when validating Entity identification.

7.6. Consolidation Level as another part of the <xbrli:entity> <xbrli:identifier> in each Fact

```
<xbrli:context id="c1317">
  <xbrli:entity><xbrli:identifier      consolidationlevel="CN111"
scheme="http://standards.iso.org/iso/17442">DUMMY_LEI</xbrli:identifier></xbrli:entity>
  <xbrli:period><xbrli:instant>2018-03-31</xbrli:instant></xbrli:period>
  <xbrli:scenario>
    <xbrldi:explicitMember dimension="eba_dim:BAS">eba_BA:x17</xbrldi:explicitMember>
    <xbrldi:explicitMember dimension="eba_dim:MCY">eba_MC:x465</xbrldi:explicitMember>
  </xbrli:scenario>
</xbrli:context>
<eba_met:mi290 unitRef="uGBP" decimals="-3" contextRef="c1317">8897000</eba_met:mi290>
```

This mechanism overloads the <xbrli:entity> or the <xbrli:identifier> with a new structure. As this may have an impact on the XBRL 2.1 standard (Engel, 2003), this solution should be very carefully considered because the cost of modifying a Standard, which has been stable since 2003, is not to be underestimated.

7.7. Include Consolidation Level only once in the Instance Document

The key point here are the filing rules. Even if the XBRL syntax allows for the inclusion of several Entities and Periods in a unique XML instantiation, the filing rules restricts that flexibility.

In most, if not all of the filing rules, an XBRL Instance Document can only contain Facts in reference to a declaring Entity for a declaring period.

In Europe, the CEN/WS XBRL (Heinze, 2013) has agreed on the Filing Rule 2.9 Harmonisation topics — Part 4: European Filing Rules:

Rule 2.9 — One reporter
In general, an instance will be reported for only one reporter. Even if the content of the instance deals with a group of companies, there is only one entity reporting the instance to the regulator. The DTS author can determine the number of reporters in an instance.

The same Rule 2.9 has been cloned, with the same number, by the EBA filing rules (Jones, 2016) and by the EIOPA filing rules (Skopowski, 2015). This rule has been even simplified by the ESMA Filing Manual (ESMA, 2017) as "*Rule 1.2.3. All xbrli:identifier elements in an instance must have identical content*"

An option often used is a different **Entrypoint**. In the case of the examples of the EBA, we can see the difference between individual (solo) and consolidated (with a single consolidation level here). However, the cost of creating and managing each Entry point is not to be underestimated.

```
<link:schemaRef xlink:type="simple" xlink:href="http://www.eba.europa.eu/eu/fr/xbrl/crr/fws/ae/cir-680-2014/2017-04-04/mod/ae_ind.xsd" />

<link:schemaRef xlink:type="simple" xlink:href="http://www.eba.europa.eu/eu/fr/xbrl/crr/fws/ae/cir-680-2014/2017-04-04/mod/ae_con.xsd" />
```

Another option is to create a specific **Consolidation Level Tag** (as Primary Item unique in the Instance Document), following the rules of a standards XBRL Tag, as for instance:

<eba_**typ:CN** contextRef="c1">**111**</eba_**typ:CN**>

Another further solution is used in both EBA and EIOPA for including data in a single point of the XBRL Instance Document: the **Filing Indicators**.

Both EBA and EIOPA use **Filing Indicators** for several purposes. A Filing Indicator is a keyword included in the Instance Document, whose meaning is explained in the Filing Rules:

> *Filing indicators: indicate the reporting units (typically templates) reported in the instance (EBA Filing Rules, page 7)*

A possible option would be to include the Consolidation Level only once in the XBRL Instance Document, as a **Filing Indicator**, which is a simple and already implemented, non-verbose solution.

```
<find:fIndicators>
  <find:filingIndicator contextRef="c1">CN111</find:filingIndicator>
  <find:filingIndicator contextRef="c1">A_00.01</find:filingIndicator>
</find:fIndicators>
```

7.8. Place the Consolidation Level out of the Instance Document

The last option is not to include any information about the Consolidation Level into the XBRL Instance Document. This information would be placed into the file name or other solution. Nevertheless, this approach fragments the information in several places, and would not be simultaneously accessible from a single processor (XBRL or other processor). Furthermore, it is not a Generally Accepted Best Practice and therefore is not considered in this paper.

8.- Conclusions

In accordance with the above definitions about DPM, it seems to be more practical to consider all the information in the Header (as Entity or Period) as metadata. In this way, the Data Points maintain **identical** identification irrespective of the Entity or Period, and is more easily **comparable** among different actual instantiations.

An invariable element provides information only once. Repeating the same invariable element is simply redundant in storage (uses more space) and in processing (checking that the invariable element does not vary in the file).

As has been described above, the Filing Rule about the invariability of *xbrli:identifier* inside an XBRL Instance Document causes the repetition of Entity Name and Entity Schema in all contexts of an XBRL Instance Document to be redundant. As a typical XBRL Instance Document for EBA and EIOPA may have thousands of contexts, all the with the same *xbrli:identifier*, this redundancy is extremely verbose.

Following the same logic, an invariable element, applicable to all the Data Points in a DPM, should not be defined at the Data Point level, as it adds no information at all. Therefore, the Dimension *Entity* must not be used. Only in the instantiation of a DPM for a particular Entity does the identification of the Entity have any sense.

As a general conclusion, the most advisable approach is to include the Consolidation Level only once inside the XBRL Instance Document.

Figures

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