29th Eurofiling Conference

5th and 6th June 2024 | Central Bank of Ireland | Dublin, Ireland

XBRL and SDMX: A conceptual mapping

Antonio Olleros
MeaningfulData (software vendor)

Similarities:

Differences:

- ☐ Standards
- ☐ Support regulatory data exchange (and beyond)
- ☐ Exchange metadata as a basis
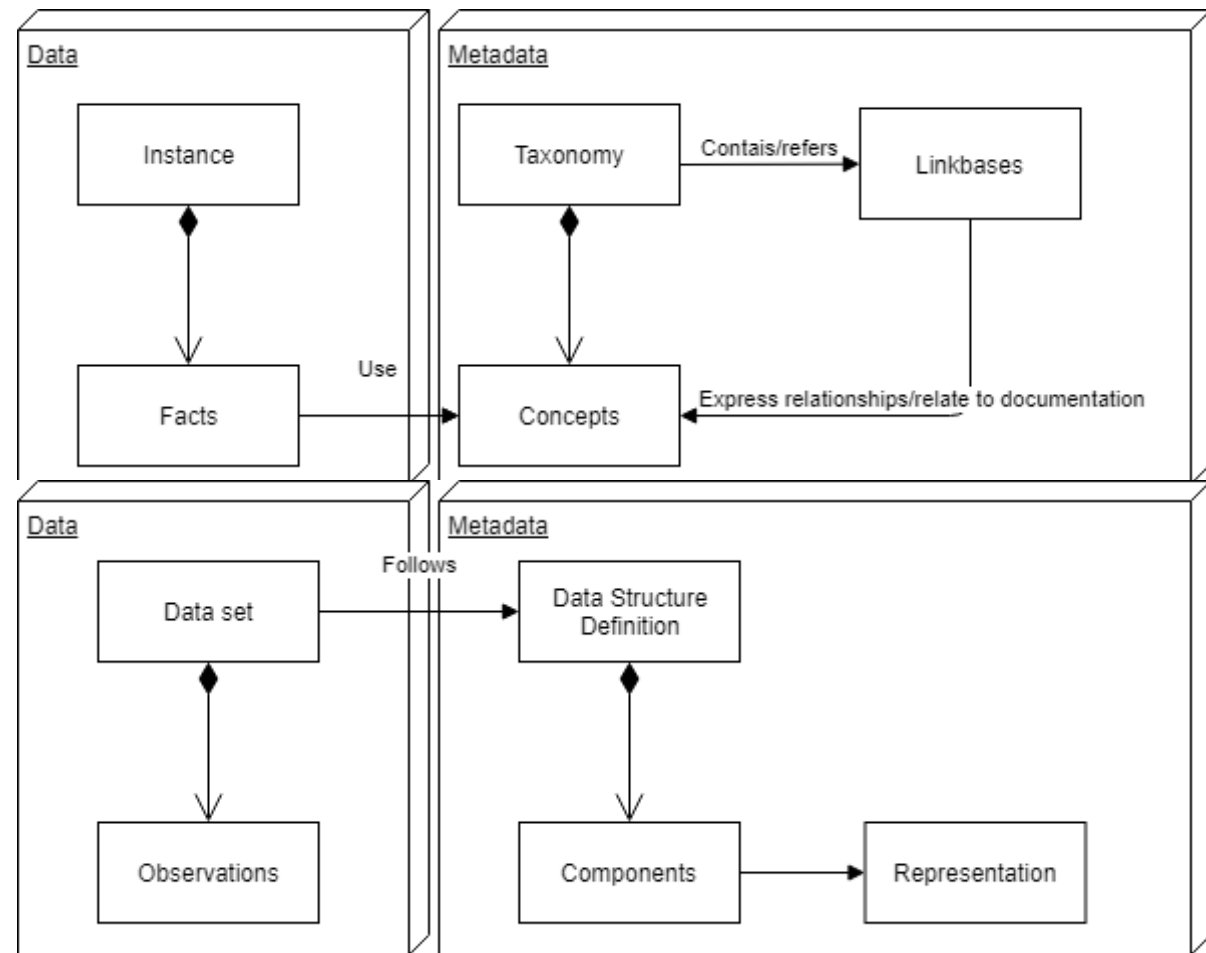- ☐ For the generation of instance files with data.

- ☐ XBRL follows a **fact-centric** approach
- ☐ SDMX follows a **dataset-centric** approach

Analogue role, different approaches

XBRL and SDMX: Different paradigms

XBRL Building blocks
(Fact-centric approach)

SDMX Building blocks
(Dataset-centric approach)

Data

Instance

Facts

Metadata

Taxonomy → Contais/refers → Linkbases

Concepts

Use

Express relationships/relate to documentation

Data

Data set

Observations

Metadata

Follows

Data Structure Definition

Components → Representation

Key for a mapping: Dataset <--> Facts

XBRL to SDMX: Convert a set of facts into a multidimensional dataset

- We need convetions!

SDMX to XBRL: Convert a multidimensional dataset into a set of facts

- We need conventions as well, but it is rather trivial

Constraints

- [ ] The conventions needs to be at the level of **taxonomy**

- [ ] An SDMX dataset may have any number of **dimensions**

- [ ] All values for SDMX dimensions should be **explicit**

- [ ] Every characteristic in the instances should be treated as a dataset **component**

Candidates

- [ ] One **module** ≈ One dataset

- [ ] One **hypercube** ≈ One dataset

XBRL is **a fact-centric** format, while **SDMX** is a **dataset-centric** format

The main **challenge** is how to translate XBRL artifacts to an SDMX dimensional data structure

Hypercubes and **modules** may play a key role in the conversion, because they may represent data structures

There is **no** such a thing as a **perfect one-fits-all mapping** between XBRL and SDMX!! ➔ Importance of a use case

Thank you for your attention!

info@meaningfuldata.eu

antonio.olleros@meaningfuldata.eu

Seeing XBRL FACTS as RECORDS of a dataset

Concept

Context

- Entity
- Period
- Segment/Scenario

Decimals

Unit of reference

Observation

```
<tax1:Loans
    contextRef="20180331_ES_EUR"
    unitRef="EUR"
    decimals="0">157235
</tax1:Loans>
<tax1:Securities
    contextRef="20180331_ES_EUR"
    unitRef="EUR"
    decimals="0">217653
</tax1:Securities>
```

```
<xbrli:context id="20180331_ES_EUR">
 <xbrli:entity>
  <xbrli:identifier scheme="http://acme.org">018</xbrli:identifier>
  <xbrli:segment>
   <xbrldi:explicitMember dimension="tax1:locationOfActivities">tax1:ES</xbrldi:explicitMember>
   <xbrldi:explicitMember dimension="tax2:currencyOfInstrument">tax1:EUR</xbrldi:explicitMember>
  </xbrli:segment>
 </xbrli:entity>
 <xbrli:period>
  <xbrli:instant>2018-03-31</xbrli:instant>
 </xbrli:period>
</xbrli:context>
```

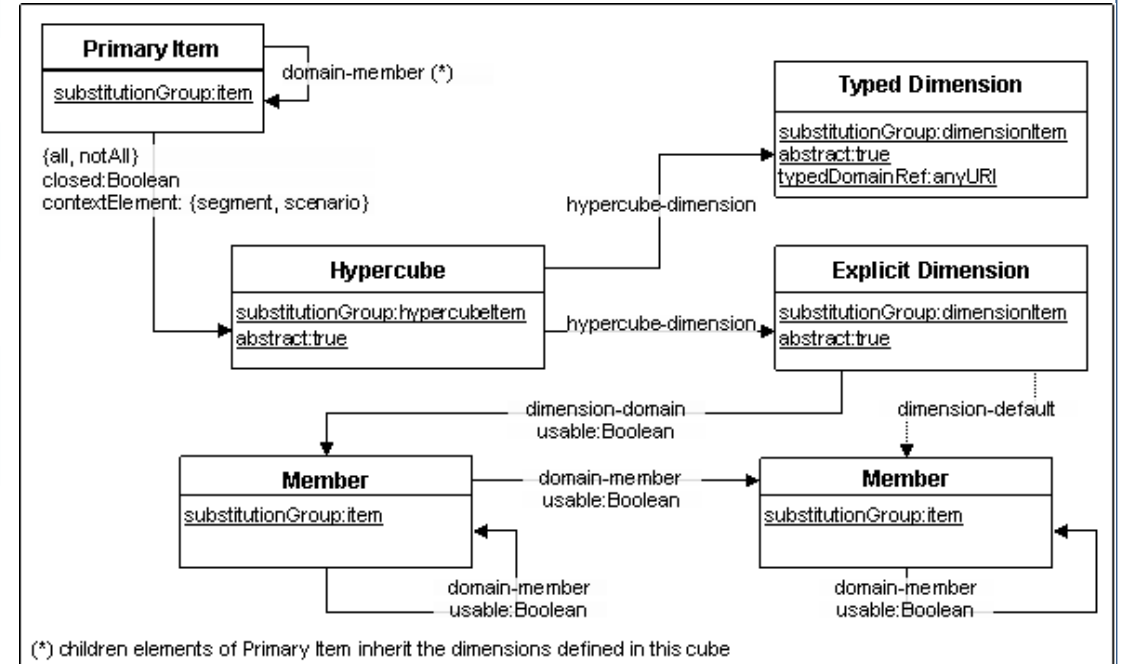| entity	period	primaryItem	locationOfActivities	currencyOfInstrument	observation	unitRef	decimals
018	2018-03-31	Loans	ES	EUR	157235	EUR	0
018	2018-03-31	Securities	ES	EUR	217653	EUR	0

Example of convention: Using hypercubes to map

Hypercubes define a kind of data structure

Primary items are considered another dimension

Some dimensions and attributes remain implicit:

- Entity
- Period
- Unit
- Decimals

Primary Item

substitutionGroup:item

domain-member (*)

{all, notAll}
closed:Boolean
contextElement: {segment, scenario}

hypercube-dimension

Typed Dimension

substitutionGroup:dimensionItem
abstract:true
typedDomainRef:anyURI

Hypercube

substitutionGroup:hypercubeItem
abstract:true

hypercube-dimension

Explicit Dimension

substitutionGroup:dimensionItem
abstract:true

dimension-domain
usable:Boolean

dimension-default

Member

substitutionGroup:item

domain-member
usable:Boolean

Member

substitutionGroup:item

domain-member
usable:Boolean

domain-member
usable:Boolean

(*) children elements of Primary Item inherit the dimensions defined in this cube

Converting XBRL taxonomies

Dimension Relationships	Arcrole
⊟ [2100] Credit Card Business	
⊟ Statement showing details of Credit card business carried by banks or through its subsidiar	
⊟ Credit card business [table]	all
⊞ Region of business [axis]	hypercube-dimension
⊟ Category of Credit cards [axis]	hypercube-dimension
⊟ Category of Credit cards [domain]	dimension-domain
Domestic Credit cards [member]	domain-member
International Credit cards [member]	domain-member
⊞ Asset classification [axis]	hypercube-dimension
⊞ Details of Credit card business [line items]	domain-member

Viewing: CreditCardBusinessHypercube [1.0]

Dimensions

[entity] Entity dimension

[TIME_PERIOD] Time period dimension

[primaryItem] Primary item dimension

[AO] Area of operation

[in-rbi-rep_CategoryOfCreditCardsAxis] CategoryOfCreditCardsAxis

[in-rbi-rep_AssetClassificationAxis] AssetClassificationAxis

Primary Measure

[OBS_VALUE] ObservationValue

Dataset Attributes

- n/a -

Series Attributes

Data Type: RBI:in-rbi-rep_CategoryOfCreditCardsDomain(1.0)

Enumeration Restrictions: No Additional Restrictions

Id	Name
in-rbi-rep_DomesticCreditCardsMember	DomesticCreditCardsMember
in-rbi-rep_InternationalCreditCardsMember	InternationalCreditCardsMember

Showing 1 to 2 of 2 entries

Search:

Converting instances

```
<in-rbi-rep:AggregateNumberOfCardHoldersForCreditCardBusiness
    contextRef="fromto_20181001_20181231_DomesticCreditCardsMember_DomesticMember"
    unitRef="PURE"
    decimals="INF" >34</in-rbi-rep:AggregateNumberOfCardHoldersForCreditCardBusiness>
```

```
<xbrli:context id="fromto_20181001_20181231_DomesticCreditCardsMember_DomesticMember">
    <xbrli:entity>
        <xbrli:identifier scheme="http://www.rbi.gov.in/000/2010-12-31">
            041</xbrli:identifier>
        <xbrli:segment>
            <xbrldi:explicitMember
                dimension='in-rbi-rep:CategoryOfCreditCardsAxis'>
                in-rbi-rep:DomesticCreditCardsMember</xbrldi:explicitMember>
            <xbrldi:explicitMember
                dimension='in-rbi-rep:RegionOfBusinessAxis'>
                in-rbi-rep:DomesticMember</xbrldi:explicitMember>
        </xbrli:segment>
    </xbrli:entity>
    <xbrli:period>
        <xbrli:startDate>2018-10-01</xbrli:startDate>
        <xbrli:endDate>2018-12-31</xbrli:endDate>
    </xbrli:period>
</xbrli:context>
```

```
<message:DataSet action="Replace"
    structureRef="in-rbi-rep_CreditCardBusinessHypercube"
    validFromDate="2019-06-16T19:00:43">
    <generic:Series>
        <generic:SeriesKey>
            <generic:Value id="entity" value="041"/>
            <generic:Value id="in-rbi-rep_CategoryOfCreditCardsAxis"
                value="in-rbi-rep_DomesticCreditCardsMember"/>
            <generic:Value id="AO" value="D"/>
            <generic:Value id="primaryItem"
                value="in-rbi-rep_AggregateNumberOfCardHoldersForCreditCardBusiness"/>
        </generic:SeriesKey>
        <generic:Attributes>
            <generic:Value id="startDate" value="2018-10-01"/>
            <generic:Value id="decimals" value="INF"/>
            <generic:Value id="unitRef" value="xbrli:pure"/>
        </generic:Attributes>
        <generic:Obs>
            <generic:ObsValue id="OBS_VALUE" value="34"/>
            <generic:ObsDimension id="TIME_PERIOD" value="2018-12-31"/>
        </generic:Obs>
    </generic:Series>
```