

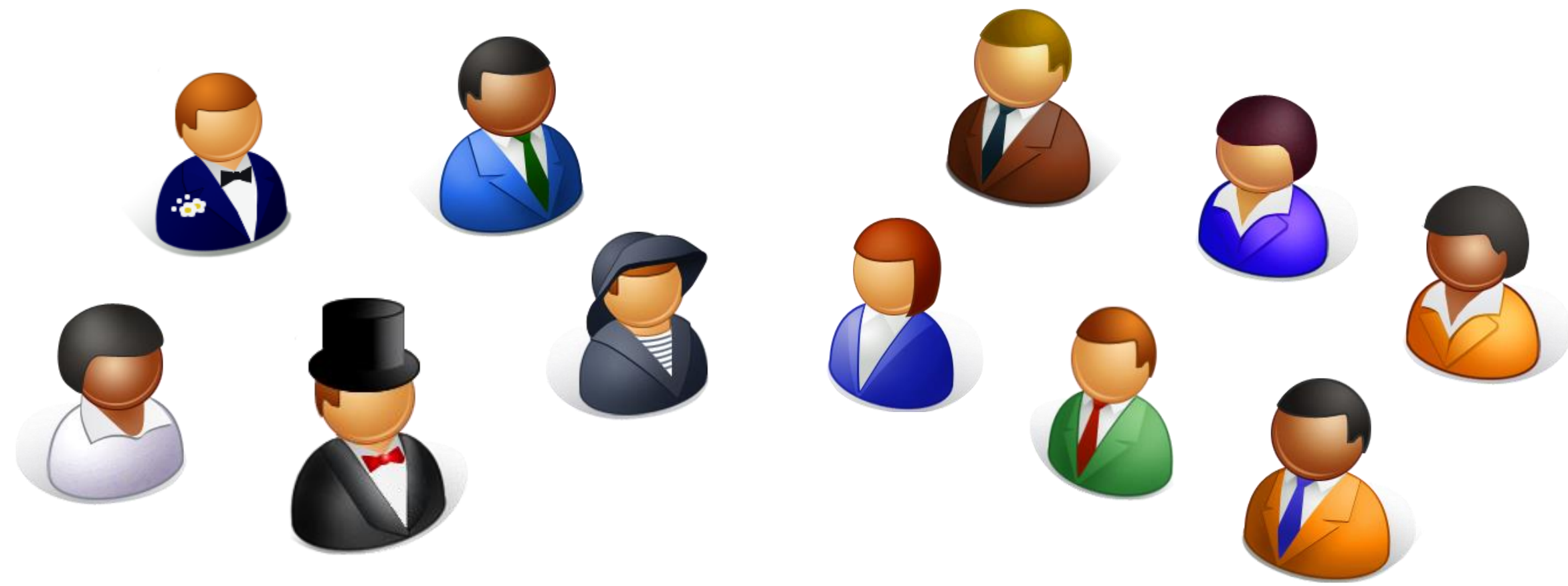
# XBRL Technical Training

SAICA, Johannesburg, South Africa

15<sup>th</sup> August 2019

Michal Zubrycki  
[michal.zubrycki@br-ag.eu](mailto:michal.zubrycki@br-ag.eu)

# Who are you?



*Department/Role/Responsibilities?*

# What are we going to talk about?



# Introduction to XBRL and inline XBRL

# What is a standard?



WIKIPEDIA  
The Free Encyclopedia

Main page  
Contents  
Featured content  
Current events  
Random article  
Donate to Wikipedia  
Wikipedia store

Article Talk Read Edit View history Search

## Technical standard

From Wikipedia, the free encyclopedia

*This article is about technical standards. For other uses, see Standard.*

A **technical standard** is an established **norm** or **requirement** in regard to technical **systems**. It is usually a formal document that establishes uniform engineering or technical criteria, methods, processes and practices. In contrast, a custom, **convention**, company product, corporate standard, etc. that becomes generally accepted and dominant is often called a *de facto* standard.



### Industry standards:

- Producer, Product, ...
- Person, Social security number, ....
- Artist, Album, Song, ...
- Author, Book, ...
- Package, Sender, Receiver, ...



### standards:

- collaborative effort of interested parties for public usage
- free from license fees and any charges
- already contain basic required functionalities (no need to reinvent the wheel)
- usually a best practice optimum and consensus of experienced contributors
- publically available documentation, tutorials, examples, forums and discussion groups, etc
- proven implementation allowing to learn from experience of others
- possibility to choose from existing solutions and change providers at any time
- ...

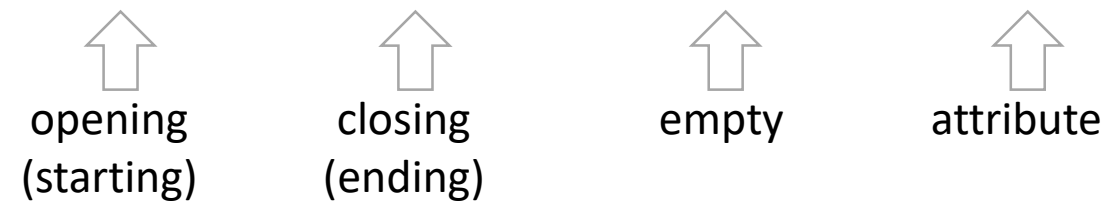


### proprietary formats:

- commercial purpose / single scenario application
- built and maintained on commercial basis
- start from scratch requires more work but allows for higher customization
- higher innovation and no inheritance of unneeded functionalities
- requires development of extensive documentation (specifications, manuals, etc)
- custom implementation - requires extensive risk analysis
- risk of dependency on a single provider (cost increase, bankruptcy, ..)
- ...

# What is XML?

- eXtensible Markup Language
- developed by W3C
- framework for development of data exchange formats
- markup (tag):
  - annotates fragments of a text document in order assign it with meaning or for processing purposes
  - text within angle brackets: `<markup>`, `</markup>`, `<markup attribute="..."/>`



- examples:

```
<person sex="male" age="49">John Smith</person>
```

```
<album genre="pop">
```

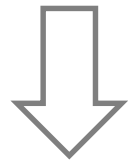
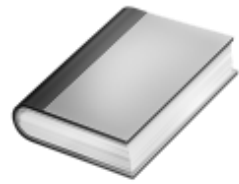
```
  <title>X&Y</title>
```

```
  <artist country="England">Coldplay</artist>
```

```
</album>
```

- XML is just syntax, a basis for defining domain specific standards: MathML, ebXML, BioML, ... (Wikipedia lists over 200 standards)

# How to describe a car in XML?



Properties of a car:

- make,
- model,
- colour,
- *engine*,
- *number of seats*,
- *segment*,
- *drive*,
- ...



*Make:* Audi

*Model:* R8

*Colour:* ibis white



*Make:* Ferrari

*Model:* Italia

*Colour:* rosso corsa



*Make:* Lamborghini

*Model:* Reventon

*Colour:* Daytona grey

```
<car>ibis white Audi R8</car>
```

```
<car colour="ibis white">Audi R8</car>
```

```
<car colour="ibis white" make="Audi">R8</car>
```

```
<car colour="ibis white" make="Audi" model="R8"/>
```

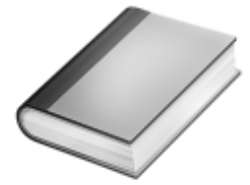
```
<car>
  <colour>ibis white</colour>
  <make>Audi</make>
  <model>R8</model>
</car>
```

```
<car colour="ibis white">
  <make>Audi</make>
  <model>R8</model>
</car>
```

```
<auto>ibis white Audi R8</auto>
```

Definition of structure (metadata): XML Schema

# What is metadata and data in XML?



## Metadata

In XML defined in **XML Schema**:

- Which are the markups? What are their names and allowed values?
- Do they have any attributes? What are the names and allowed values for these attributes?
- What is the structure of markup – is there any nesting?

Make	Model	Colour
Audi	R8	ibis white
Ferrari	Italia	rosso corsa
Lamborghini	Reventon	Daytona grey



## Data

Information for each car (make, model and colour) described in **XML Instance document** using markups, attributes and structures described in XML Schema



# How does the XML look on an example? (1)

cars\_schema.xsd:

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
  targetNamespace="http://www.ebay.com/cars"
  xmlns:cars="http://www.ebay.com/cars"
  elementFormDefault="qualified"
  attributeFormDefault="unqualified">
  <xs:element name="cars">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="car" type="xs:string" maxOccurs="unbounded"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
</xs:schema>
```

cars\_instance\_document.xml:

```
<?xml version="1.0" encoding="UTF-8"?>
<ec:cars xmlns:ec="http://www.ebay.com/cars"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.ebay.com/cars cars_schema.xsd">
  <ec:car>ibis white Audi R8</ec:car>
  <ec:car>rosso corsa Ferrari Italia</ec:car>
  <ec:car>Daytona grey Lamborghini Reventon</ec:car>
</ec:cars>
```

Alternative (two XML schemas):

cars\_schema1.xsd:

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
  targetNamespace="http://www.ebay.com/cars1" xmlns:ec1="http://www.ebay.com/cars1"
  elementFormDefault="qualified" attributeFormDefault="unqualified">
  <xs:element name="car" type="xs:string"/>
</xs:schema>
```

cars\_schema2.xsd:

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
  targetNamespace="http://www.ebay.com/cars2" xmlns:ec2="http://www.ebay.com/cars2"
  xmlns:ec1="http://www.ebay.com/cars1"
  elementFormDefault="qualified" attributeFormDefault="unqualified">
  <xs:import namespace="http://www.ebay.com/cars1" schemaLocation="cars_schema1.xsd"/>
  <xs:element name="cars" type="ec2:carType"/>
  <xs:complexType name="carType">
    <xs:sequence>
      <xs:element ref="ec1:car" maxOccurs="unbounded"/>
    </xs:sequence>
  </xs:complexType>
</xs:schema>
```

cars\_instance\_document.xml:

```
<?xml version="1.0" encoding="UTF-8"?>
<ec2:cars xmlns:ec2="http://www.ebay.com/cars2" xmlns:ec1="http://www.ebay.com/cars1"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.ebay.com/cars2 cars_schema2.xsd">
  <ec1:car>ibis white Audi R8</ec1:car>
  <ec1:car>rosso corsa Ferrari Italia</ec1:car>
  <ec1:car>Daytona grey Lamborghini Reventon</ec1:car>
</ec2:cars>
```

# How does the XML look on an example? (2)

Local data type:

cars\_schema.xsd:

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
  xmlns:ec="http://www.ebay.com/cars"
  targetNamespace="http://www.ebay.com/cars"
  elementFormDefault="qualified"
  attributeFormDefault="unqualified">
  <xs:element name="cars">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="car" maxOccurs="unbounded">
          <xs:complexType>
            <xs:simpleContent>
              <xs:extension base="xs:string">
                <xs:attribute name="colour" type="xs:string"/>
              </xs:extension>
            </xs:simpleContent>
          </xs:complexType>
        </xs:element>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
</xs:schema>
```

cars\_instance\_document.xml:

```
<?xml version="1.0" encoding="UTF-8"?>
<ec:cars xmlns:ec="http://www.ebay.com/cars"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.ebay.com/cars cars_schema.xsd">
  <ec:car colour="ibis white">Audi R8</ec:car>
  <ec:car colour="rosso corsa">Ferrari Italia</ec:car>
  <ec:car colour="Daytona gray">Lamborghini Reventon</ec:car>
</ec:cars>
```

Global data type:

cars\_schema.xsd:

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
  xmlns:ec="http://www.ebay.com/cars"
  targetNamespace="http://www.ebay.com/cars"
  elementFormDefault="qualified"
  attributeFormDefault="unqualified">
  <xs:element name="cars">
    <xs:complexType>
      <xs:sequence>
        <xs:element ref="ec:car" maxOccurs="unbounded"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
  <xs:element name="car">
    <xs:complexType>
      <xs:simpleContent>
        <xs:extension base="xs:string">
          <xs:attribute ref="ec:colour"/>
        </xs:extension>
      </xs:simpleContent>
    </xs:complexType>
  </xs:element>
  <xs:attribute name="colour" type="xs:string"/>
</xs:schema>
```

Nested elements:

cars\_schema.xsd:

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
  xmlns:ec="http://www.ebay.com/cars"
  targetNamespace="http://www.ebay.com/cars"
  elementFormDefault="qualified"
  attributeFormDefault="unqualified">
  <xs:element name="cars">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="car" maxOccurs="unbounded">
          <xs:complexType>
            <xs:sequence>
              <xs:element name="make" type="xs:string" />
              <xs:element name="model" type="xs:string"/>
            </xs:sequence>
            <xs:attribute name="colour" type="xs:string"/>
          </xs:complexType>
        </xs:element>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
</xs:schema>
```

cars\_instance\_document.xml:

```
<?xml version="1.0" encoding="UTF-8"?>
<ec:cars xmlns:ec="http://www.ebay.com/cars"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.ebay.com/cars cars_schema.xsd">
  <ec:car colour="ibis white">
    <ec:make>Audi</ec:make>
    <ec:model>R8</ec:model>
  </ec:car>
  <ec:car colour="rosso corsa">
    <ec:make>Ferrari</ec:make>
    <ec:model>Italia</ec:model>
  </ec:car>
  <ec:car colour="Daytona grey">
    <ec:make>Lamborghini</ec:make>
    <ec:model>Reventon</ec:model>
  </ec:car>
</ec:cars>
```

# How does the XML look on an example? (3)

Enumerated data type:

cars\_schema.xsd:

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
  xmlns:ec="http://www.ebay.com/cars"
  targetNamespace="http://www.ebay.com/cars"
  elementFormDefault="qualified"
  attributeFormDefault="unqualified">
  <xs:element name="cars">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="car" maxOccurs="unbounded">
          <xs:complexType>
            <xs:sequence>
              <xs:element name="make" type="ec:string20characters"/>
              <xs:element name="model" type="ec:string20characters"/>
            </xs:sequence>
            <xs:attribute name="colour" type="ec:colours"/>
          </xs:complexType>
        </xs:element>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
  <xs:simpleType name="string20characters">
    <xs:restriction base="xs:string">
      <xs:maxLength value="20"/>
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="colours">
    <xs:restriction base="xs:token">
      <xs:enumeration value="ibis white"/>
      <xs:enumeration value="rosso corsa"/>
      <xs:enumeration value="Daytona gray"/>
    </xs:restriction>
  </xs:simpleType>
</xs:schema>
```

cars\_instance\_document.xml:

```
<?xml version="1.0" encoding="UTF-8"?>
<ec:cars xmlns:ec="http://www.ebay.com/cars"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.ebay.com/cars cars_schema.xsd">
  <ec:car colour="ibis white">
    <ec:make>Audi</ec:make>
    <ec:model>R8</ec:model>
  </ec:car>
  <ec:car colour="rosso corsa">
    <ec:make>Ferrari</ec:make>
    <ec:model>Italia</ec:model>
  </ec:car>
  <ec:car colour="">
    <ec:make>Lal</ec:make>
    <ec:model>Re</ec:model>
  </ec:car>
</ec:cars>
```

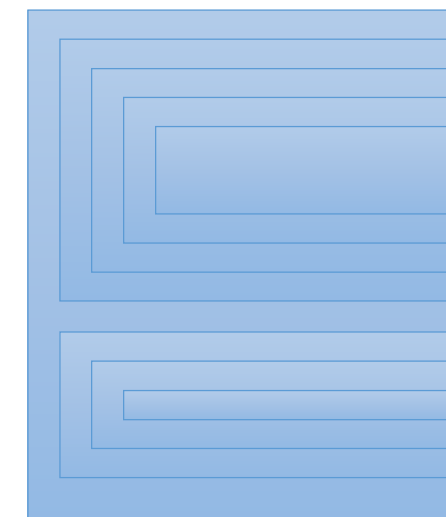
ibis white
rosso corsa
Daytona gray

# What are the problems with XML?

XML Schema allows setting rules on content of XML Instance Documents

- names of markups and attributes
- values of markups and attributes
- structure of nesting

XML Schema



XML Instance document



## Problems

structures can be very complex and present only a single view (difficult to define different classifications)

structures cannot be modified without losing comparability

no semantics behind structures (markups, nesting and attributes are just technical syntax structures)



## Solutions

separate structures from definitions of markups

allow for flexible creation of relations between markups in a different place

add semantics to relations

# How do the XML problems look on an example?



ebay\_cars.xsd

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
  targetNamespace="http://www.ebay.com/cars"
  xmlns:ec="http://www.ebay.com/cars"
  elementFormDefault="qualified" attributeFormDefault="unqualified">
  <xs:element name="cars">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="car" maxOccurs="unbounded">
          <xs:complexType>
            <xs:sequence>
              <xs:element name="make" type="xs:string"/>
              <xs:element name="model" type="xs:string"/>
            </xs:sequence>
          </xs:complexType>
          <xs:attribute name="colour" type="ec:colours"/>
        </xs:element>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
</xs:schema>
```



amazon\_autos.xsd:

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
  targetNamespace="http://www.amazon.com/autos"
  xmlns:aa="http://www.amazon.com/autos"
  elementFormDefault="qualified" attributeFormDefault="unqualified">
  <xs:element name="autos">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="auto" maxOccurs="unbounded">
          <xs:complexType>
            <xs:sequence>
              <xs:element name="make" type="xs:string"/>
              <xs:element name="model" type="xs:string"/>
              <xs:element name="segment" type="xs:string"/>
            </xs:sequence>
          </xs:complexType>
          <xs:attribute name="paint" type="aa:colours"/>
        </xs:element>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
</xs:schema>
```

# What is the solution to the XML problem?

cars\_schema.xsd

```
<xs:element name="car" id="car" (...)/>
<xs:element name="make" id="make" (...)/>
<xs:element name="model" id="model" (...)/>
<xs:element name="segment" id="segment" (...)/>
<xs:element name="paint" id="paint" (...)/>
```

ebay\_structures.xml

```
<cars xlink:type="extended" xlink:role="http://www.ebay.com/cars"/>
  <item xlink:type="locator" xlink:href="cars_schema.xsd#car" xlink:label="carItem">
  <item xlink:type="locator" xlink:href="cars_schema.xsd#make" xlink:label="makeItem">
  <item xlink:type="locator" xlink:href="cars_schema.xsd#model" xlink:label="modelItem">
  <item xlink:type="locator" xlink:href="cars_schema.xsd#paint" xlink:label="paintAttribute">
  <link xlink:type="arc" xlink:from="carItem" xlink:to="makeItem" xlink:role="http://item-item.link" xlink:order="1"/>
  <link xlink:type="arc" xlink:from="carItem" xlink:to="modelItem" xlink:role="http://item-item.link" xlink:order="2"/>
  <link xlink:type="arc" xlink:from="carItem" xlink:to="paintAttribute" xlink:role="http://item-attribute.link"/>
  <name xlink:type="resource" xlink:label="paintLabel">colour</name>
  <link xlink:type="arc" xlink:from="paintAttribute" xlink:to="paintLabel" xlink:role="http://attribute-name.link"/>
</cars>
```



amazon\_structures.xml

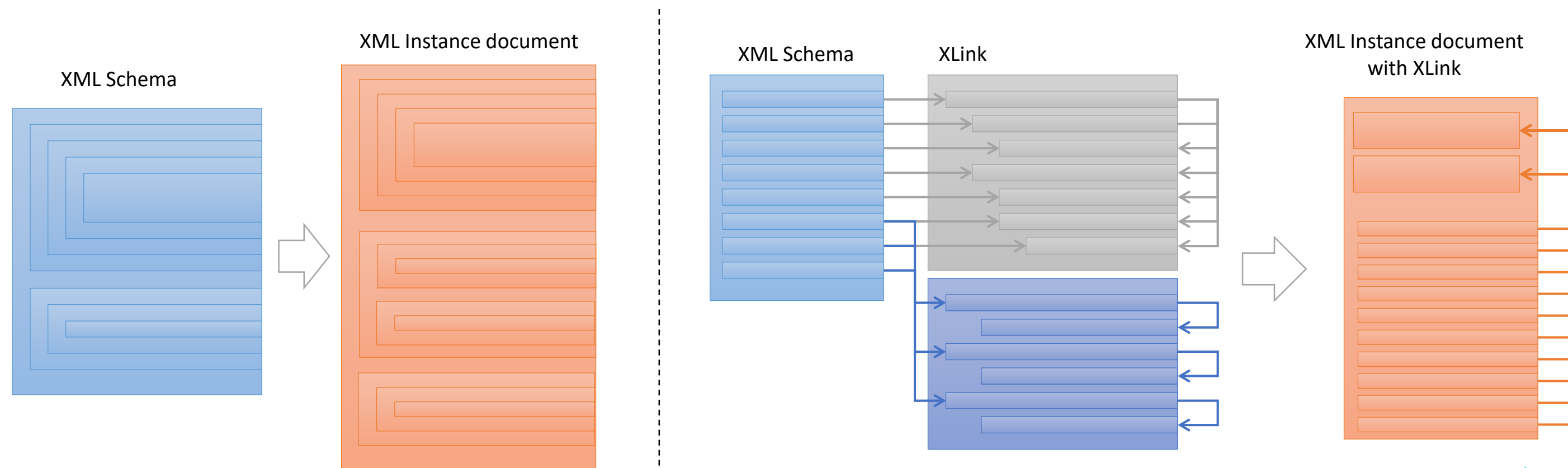
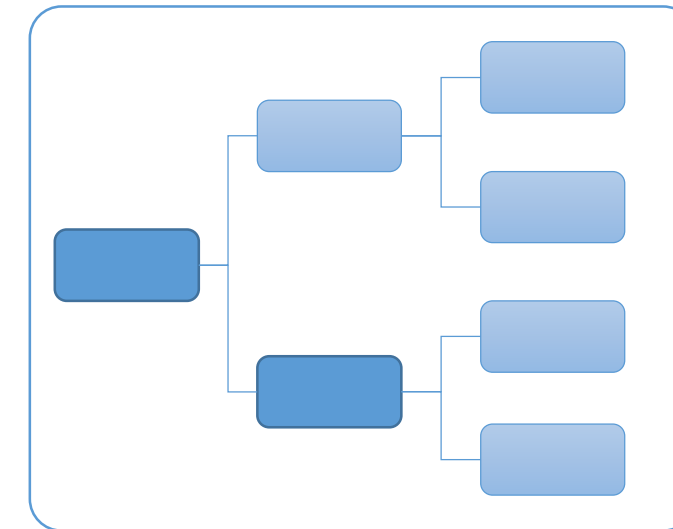
```
<cars xlink:type="extended" xlink:role="http://www.amazon.com/autos"/>
  <item xlink:type="locator" xlink:href="cars_schema.xsd#car" xlink:label="carItem">
  <item xlink:type="locator" xlink:href="cars_schema.xsd#make" xlink:label="makeItem">
  <item xlink:type="locator" xlink:href="cars_schema.xsd#model" xlink:label="modelItem">
  <item xlink:type="locator" xlink:href="cars_schema.xsd#segment" xlink:label="segmentItem">
  <item xlink:type="locator" xlink:href="cars_schema.xsd#colour" xlink:label="colourAttribute">
  <link xlink:type="arc" xlink:from="carItem" xlink:to="makeItem" xlink:role="http://item-item.link" xlink:order="1"/>
  <link xlink:type="arc" xlink:from="carItem" xlink:to="modelItem" xlink:role="http://item-item.link" xlink:order="2"/>
  <link xlink:type="arc" xlink:from="carItem" xlink:to="segmentItem" xlink:role="http://item-item.link" xlink:order="3"/>
  <link xlink:type="arc" xlink:from="carItem" xlink:to="paintAttribute" xlink:role="http://item-attribute.link"/>
  <name xlink:type="resource" xlink:label="carLabel">auto</name>
  <link xlink:type="arc" xlink:from="carItem" xlink:to="carLabel" xlink:role="http://item-name.link"/>
</cars>
```



# What is XLink and XPointer?

- XLink: XML Linking Language (<http://www.w3.org/TR/xlink/>)
  - creation of links in XML documents (e.g. between markups)
  - counterpart of <a> tag used in HTML but far more complex and useful
  - uses XPointer to locate markups in XML documents (after #):
 

```
<car xlink:href="colours.xsd#white">Audi R8</car>
```
- types of links:
  - simple (single link)
  - extended (collection of simple links)
- extensively used in XBRL



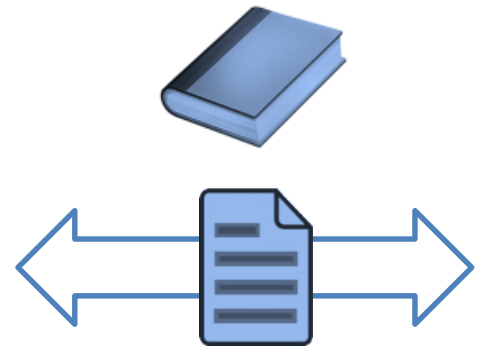
# What is XBRL?



- **X** - flexible framework: enables customization and application in different reporting scenarios independent from legal regulations
- **B** - designed for description and exchange of business related data (includes all required characteristics and functionalities for this application)
- **R** - informative reporting: exchange of aggregated data for analysis and decision making
- **L** - communication (encoding and decoding) of information: sentences/statements built according to certain syntax (grammar) and semantics (meaning)

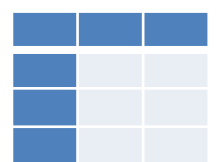
initial requirements - **standard for:**

1. **describing information requirements** in order to...
2. **...transfer it between different systems**



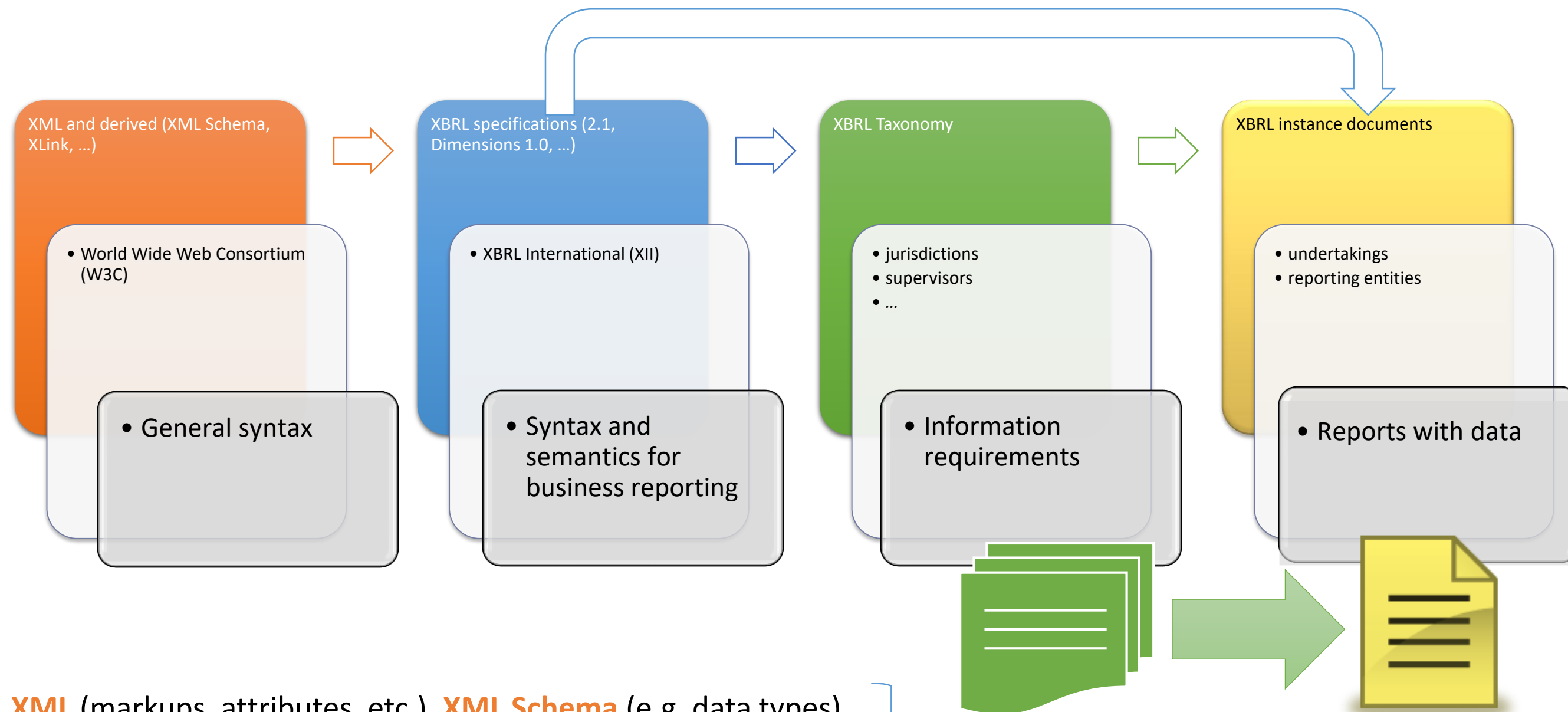
additional requirements:

3. advanced validation (mathematical/logical rules, error messaging)
4. visualization/rendering (e.g. tax forms, tables, reports)
5. versioning of definitions (dictionaries) in time/space
6. „drill-down” of information (XBRL Global Ledger)





# What are the main components of XBRL?



**XBRL** = **XML** (markups, attributes, etc.), **XML Schema** (e.g. data types)  
 + **XLink, XPointer** (links/relations)  
 + **Namespace** (owners/authors)  
 + **other rules** (np. extensions by overriding and prohibiting links)

} syntax

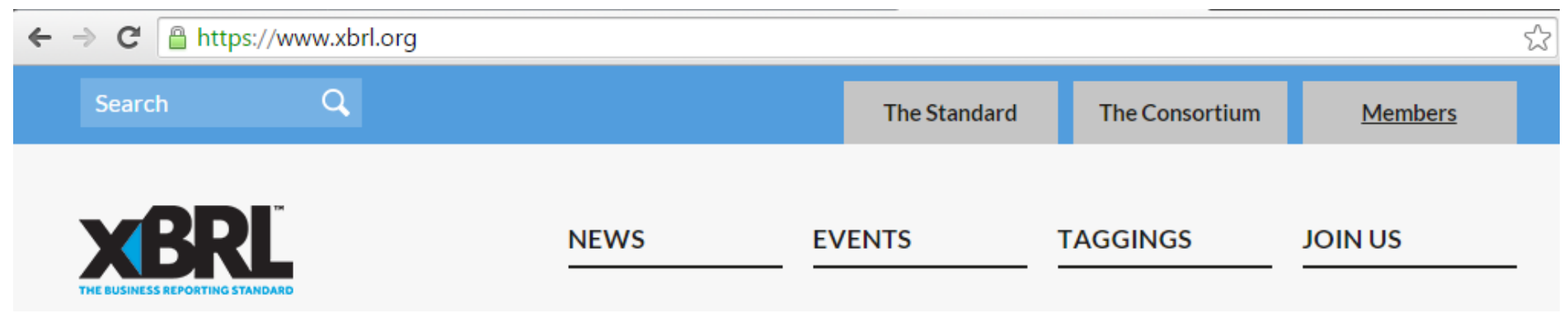
+ **semantics** (hierarchical relations, labels, references, dimensions, business rules, tabular views, etc.)

# How is XBRL governed?

- non-profit organization and local jurisdictions (coordination/management of initiatives and works)
  -
- 700+ members (direct or indirect)
  - commercial companies: audit, consulting, software, banks, stock exchanges
  - non-profit organizations: accountants, securities exchanges, banks, analysts
  - public authorities: banking supervisors/central banks, registers, securities regulators, statistical and tax offices

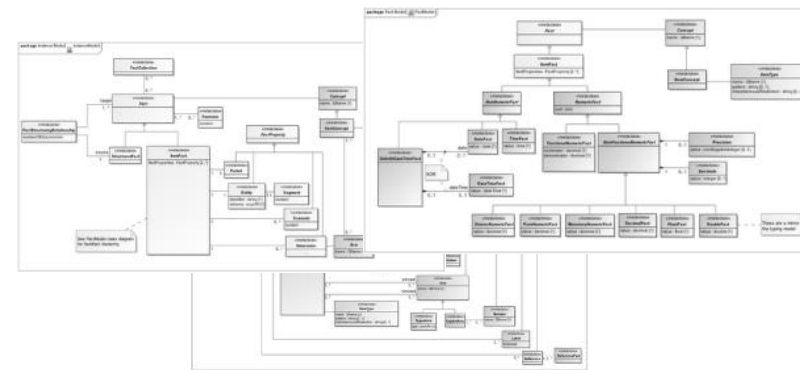


- aim: development and proliferation of XBRL through the following activities
  - management/coordination (Board of Directors, Standards Board, Best Practice Board, etc)
  - development and maintenance of specifications (working groups: permanent/temporary)
  - support in implementation projects, increasing awareness (e.g. through events, trainings, ...)
- more on:



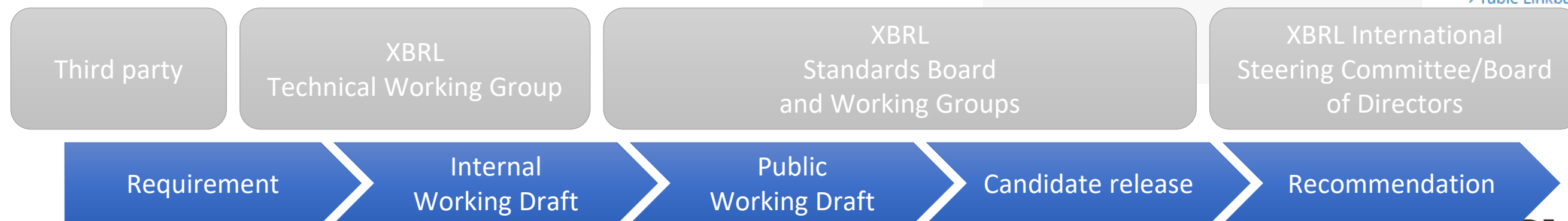
# What are the XBRL specifications?

- documents describing fundamental technical definition of how XBRL works
  - specifications
    - recommendations - XBRL 2.1, Dimensions 1.0, Formula 1.0, Inline XBRL, Table linkbase, Versioning, Extensible Enumerations, Taxonomy Packages...
    - candidate releases/recommendations – Formula Extension Modules
    - internal/public working drafts – Taxonomy Packages, Streaming Extensions, ...
  - conformance suits (tests for compliance and compatibility)
  - best practice documents (FRTA, FRIS, GFM, ...) and project specific rules (EDGAR Filer Manual, Eurofiling/EBA/EIOPA Filing Rules)
  - Abstract Model (UML diagrams) and OIM (Open Information Model: XBRL in JSON, DB, ...)
  - other: registries, collaboration, etc.



- technical files (XML Schema)

- development process:



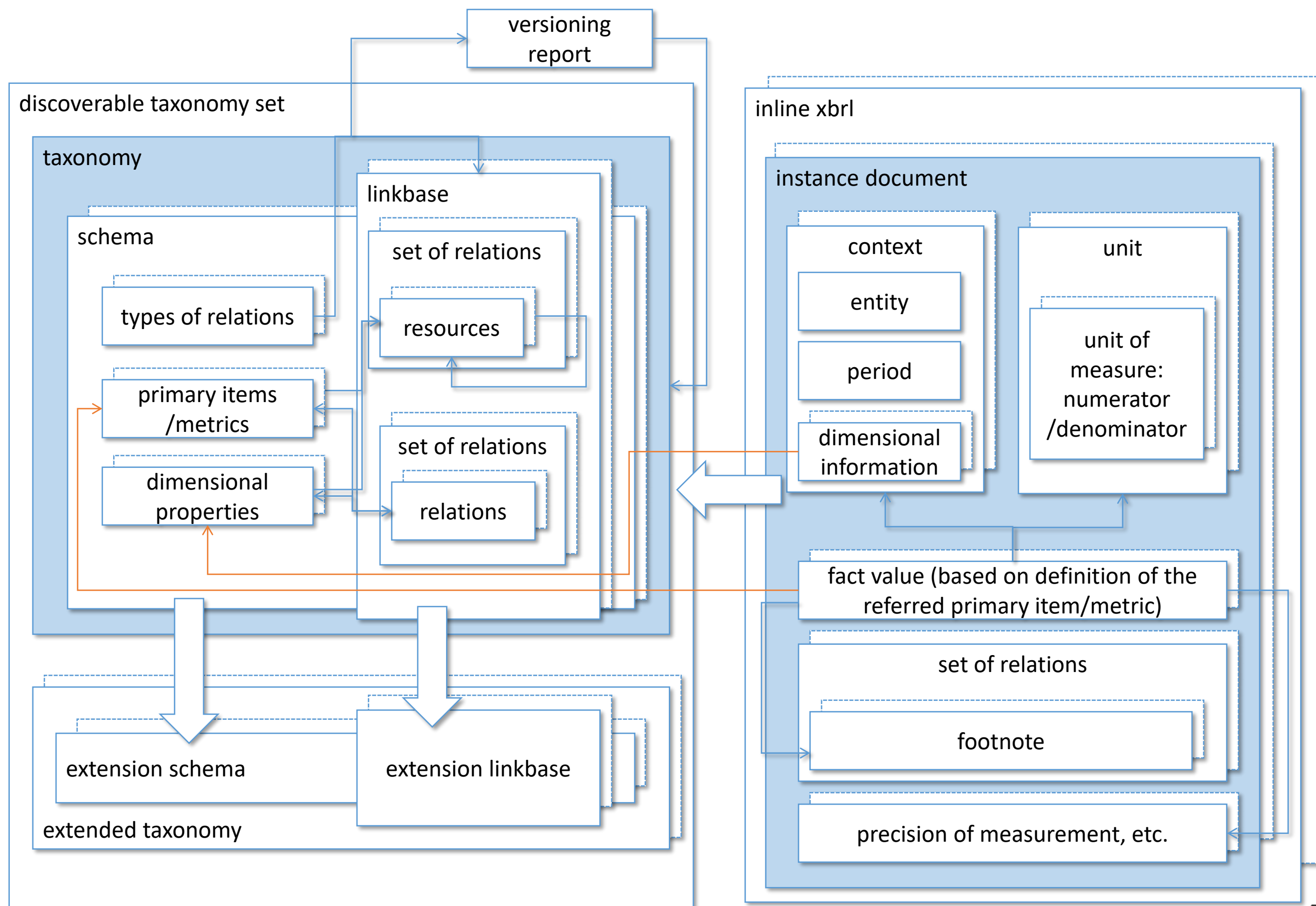
<http://specifications.xbrl.org/specifications.html>

The screenshot shows the 'XBRL Specifications' page. The main heading is 'XBRL Specifications' with a sub-heading 'The XBRL Standard / XBRL Specifications'. The page is divided into sections: 'Specification Index' (with links for 'XBRL Specifications', 'All Documents by Area', and 'All Documents by Status'), 'FAQ', 'Out for', and 'Speci comm'. A blue banner highlights 'XBRL 2.1' with a breadcrumb trail: 'The XBRL Standard / XBRL Specifications / XBRL / XBRL 2.1'. Below this, there are three sections of documents:

Specification document:			
<a href="#">XBRL Specification</a>	2013-02-20	Recommendation	HISTORY
Supporting documents:			
<a href="#">Conformance Suite</a>	2012-01-24	Conformance suite	HISTORY
Supporting documents for draft specifications:			
<a href="#">Conformance Suite Description</a>	2008-07-02	Working Group Note	HISTORY

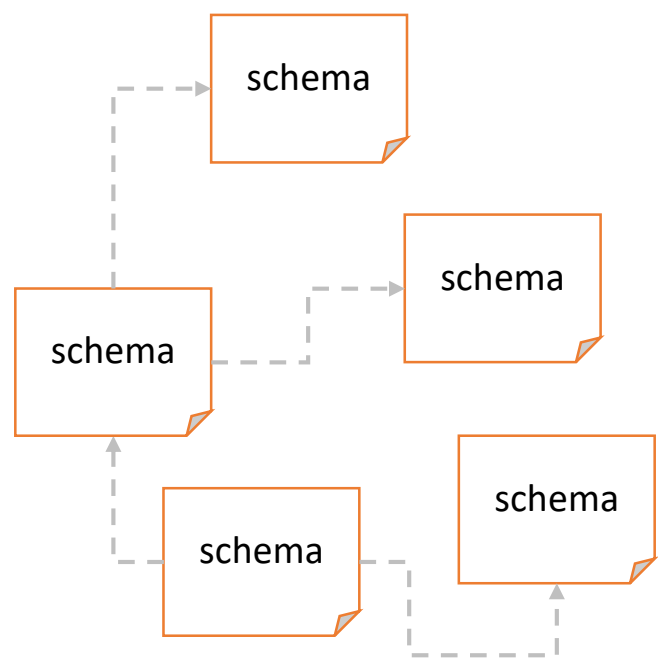
# XBRL standard architecture

# How does the XBRL standard architecture look?

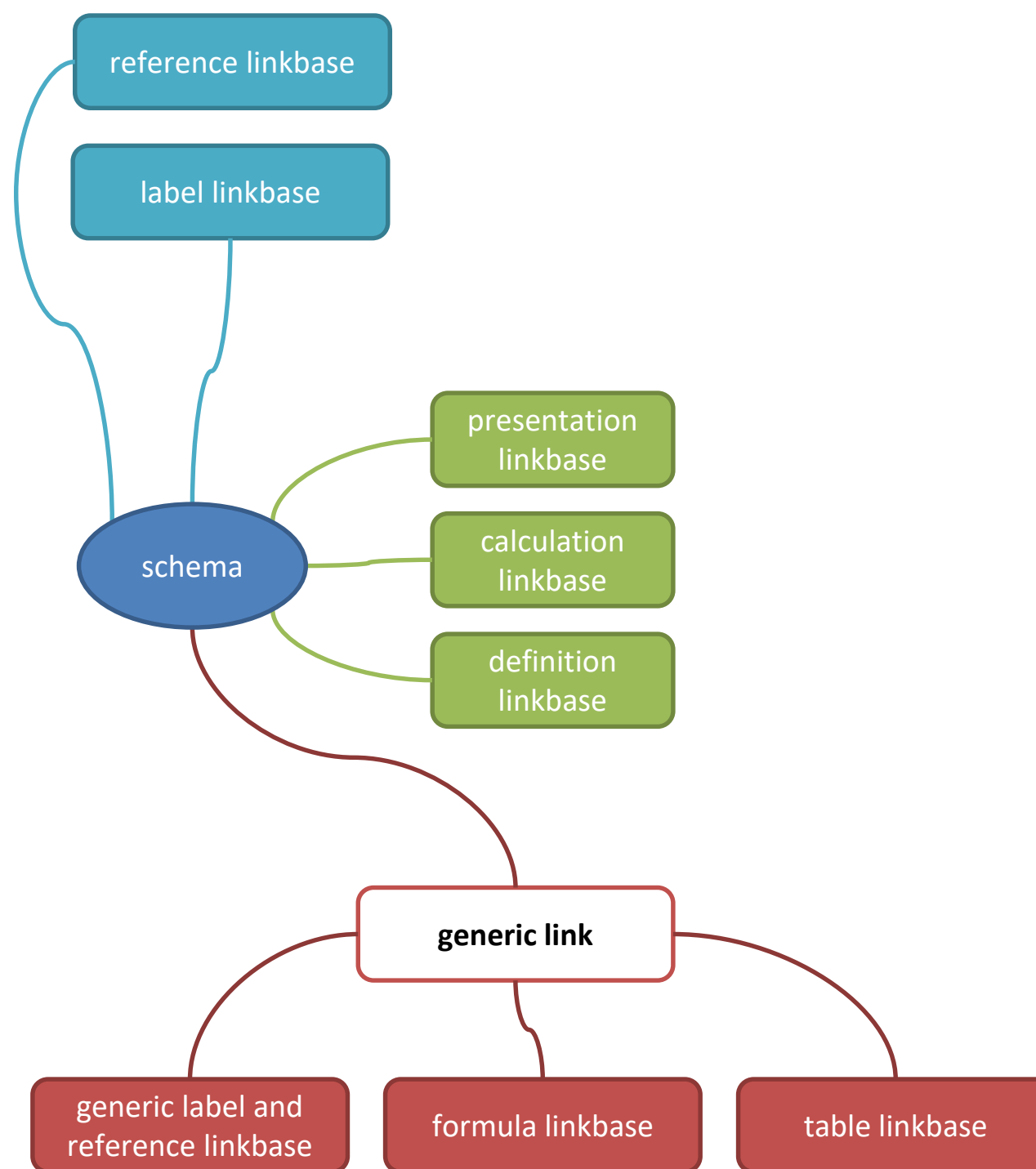
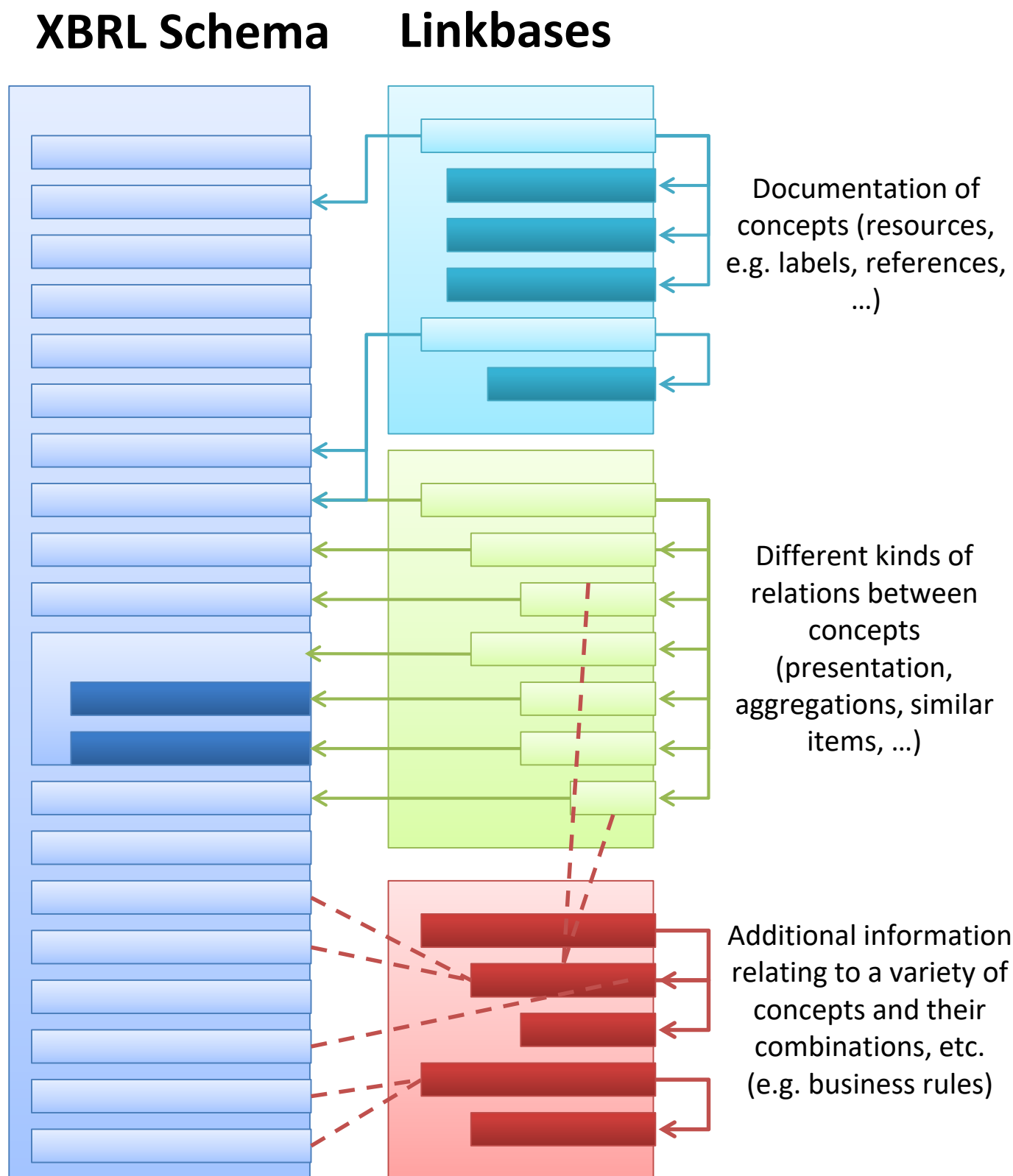


# What is the relation between schema and linkbases?

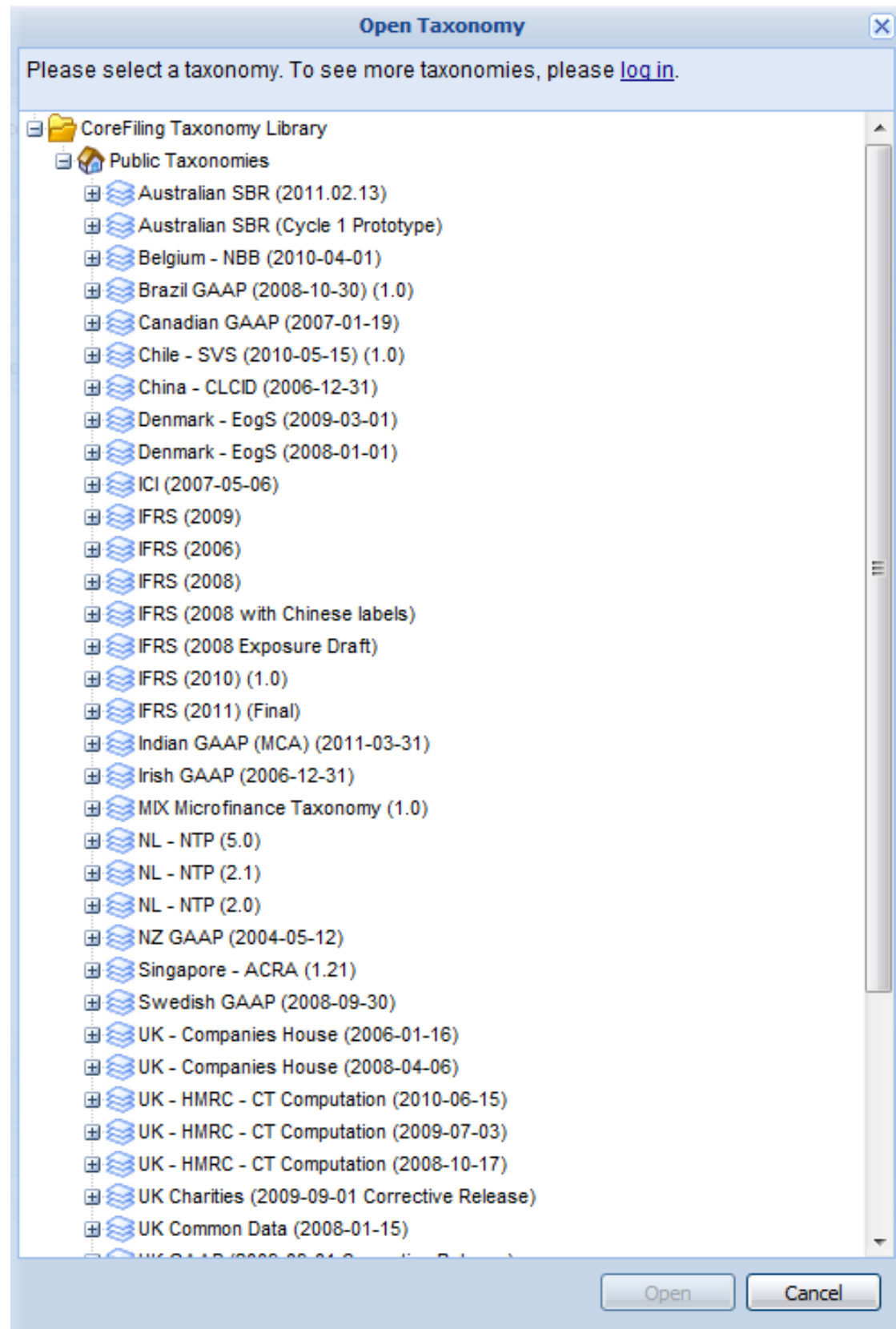
- schema defines concepts (primary items, tuples, dimensions, domain members) and their properties
- file extension *.xsd*
- definitions of concepts (business terms) and dimensional information mostly in a form of unstructured list
- taxonomy may consist of many schema files importing each other (modularization)



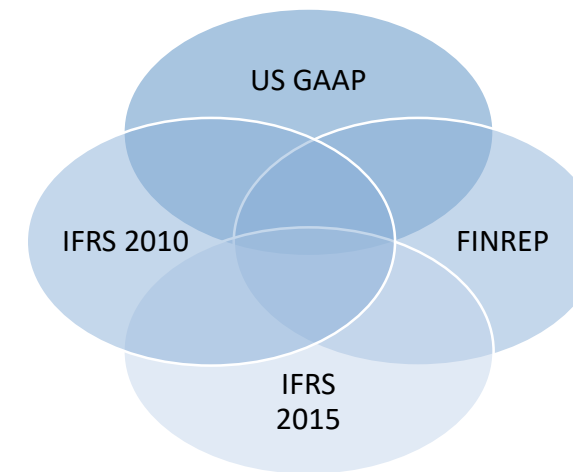
- schema files refer to linkbase files
- linkbase files may refer to definitions of concepts in schema



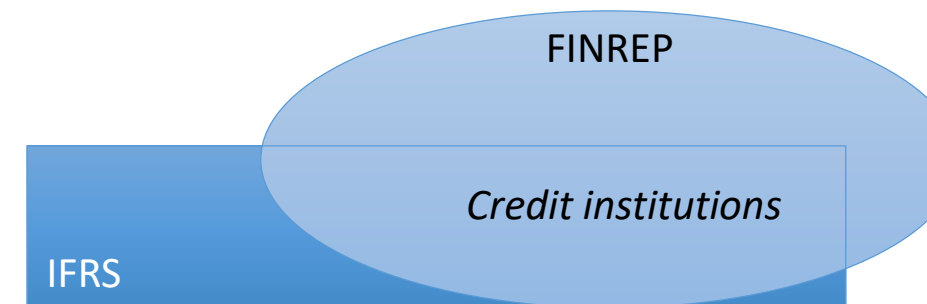
# Why do we need different taxonomies?



- is *Issued capital* always *Issued capital*? – differences in legislations and interpretations in time



- usually a taxonomy is developed for a certain legal regulation or a framework valid at a point of time
- taxonomies based on the same legal regulations/standards can import already defined taxonomies and extend (or narrow) their content, e.g. FINREP as extension of IFRS but also modified by CRD



- why? - comparability benefits, but - technical consequences and dependency issues
- need for taxonomy name – a namespace

<http://bigfoot.corefiling.com/yeti/resources/yeti-gwt/Yeti.jsp>

# What is a namespace?

- solves name conflicts: two or more concepts with the same name but different meaning (defined by different regulators under different legislation)
- setting name: *targetNamespace* attribute (describes namespace for all elements and attributes defined in a particular schema file)

```
<?xml version="1.0" encoding="UTF-8"?>
```

```
<xsd:schema
  targetNamespace="http://xbrl.ifrs.org/taxonomy/2011-03-25/ifrs"
  xmlns:link="http://www.xbrl.org/2003/linkbase"
  xmlns:nonnum="http://www.xbrl.org/dtr/type/non-numeric"
  ...
/>
```

- namespace looks like URIs (Unique Resource Identifiers) because URIs:
  - are unique
  - belong to their owner

**NOTE: these are not Internet addresses!**

- declaring reused namespace with prefix:

```
xmlns:prefix="namespace"
```

(prefix is used instead of namespace when referencing a concept)

- single taxonomy can have many schema files therefore many namespaces (usually sharing a common base component – root, and constructed according to a documented pattern, +date, scope, etc.)

## IFRS Taxonomy (ifrs-2012.xsd):

```
<xsd:schema
  xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  targetNamespace="http://www.iasb.org/xbrl/ifrs/2012"/>
<xsd:element name="Assets" ... />
<xsd:element name="Equity" ... />
...
</xsd:schema>
```

Taxonomy extension  
(my-company-2012.xsd):

```
<xsd:schema
  xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  targetNamespace="http://www.my-company.com/2012"/>
<xsd:import (...) xlink:href="ifrs-2012.xsd"/>
<xsd:element name="ExpenseForStockOptions" ... />
...
</xsd:schema>
```

Instance Document  
(my-company-2012.xbrl):

```
<xbrli:xbrl
  xmlns:xbrli="http://www.xbrl.org/2003/instance"
  xmlns:link="http://www.xbrl.org/2003/linkbase"
  xmlns:ifrs="http://www.iasb.org/xbrl/ifrs/2012"
  xmlns:us-gaap="http://www.fasb.org/xbrl/us-gaap/2012"
  xmlns:my-comp="http://www.my-company.com/2012"/>
<link:schemaRef xlink:type="simple" xlink:href="my-company-2012.xsd"/>
<link:schemaRef xlink:type="simple" xlink:href="us-gaap-2012.xsd"/>

<ifrs:Assets ...>1000</ifrs:Assets>
<us-gaap:Assets ...>1010</us-gaap:Assets>
<my-comp:ExpenseForStockOptions ...>234</my-comp:ExpenseForStockOptions>
...
</xbrli:xbrl>
```

```
<xsd:schema
  xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  targetNamespace="http://www.fasb.org/xbrl/us-gaap/2012"/>
<xsd:element name="Assets" ... />
<xsd:element name="Equity" ... />
...
</xsd:schema>
```

## US-GAAP Taxonomy (us-gaap-2012.xsd):



# What kinds of business concepts are defined in XBRL schema files?

Declaring business terms:

There is a business term defined in the IFRSs that represents **Inventories**. **Inventories** are reported as of a particular day as a monetary amount (a number referring to a currency).  
Accounting balance nature of inventories is **debit**.

Each group of inventories must be disclosed with their value according to LIFO or FIFO valuation method

Company must disclose their operations for domestic and foreign markets

Company must split their operations according to operating segments

- **item**: financial term that represents a simple fact, i.e. a fact carrying a value, e.g. *Inventories = 1200400.56 USD*
- **tuple**: represents compound facts i.e. a group of pieces of information, e.g. *Inventories Valuation* is a tuple comprising of the following items: *Group of inventories*, *Valuation method*, *Value of a group of inventories* reported sequentially as many times as needed (tables with unknown number of rows or columns)
- **dimensions** a certain breakdown or a property that may consist of **explicit list of members** or **implicit (typed) domain** e.g.
  - *Geographical areas of operations* dimension with explicit members *All regions*, *Domestic* and *Foreign*
  - *Operating segments* dimension with typed domain *SegmentName*

Inventories	...
...	...
...	...

Inventories valuation		
Group of inventories	Valuation method	Value of group of inventories
...	...	...
...	...	...

	Inventories	...
All regions	...	...
Domestic	...	...
Foreign	...	...

Operating segments	Inventories	...
...	...	...
...	...	...

# How does metadata and data definition look on an example?

Taxonomy



**Financial statement for 2014**

**ABC Company Ltd**  
LEI: KGCEPHLVVKVRZYO1T647

**Balance sheet**  
*(in thousands EUR)*

	31 December 2013	31 December 2014
...	...	...
Inventories	214 244	234 324
...	...	...

**Valuation method on 31 December 2014 (in EUR)**

Group of inventories	Valuation method	Value of group of inventories
Glass	LIFO	453 932
Steel	FIFO	1 223 443
Copper		

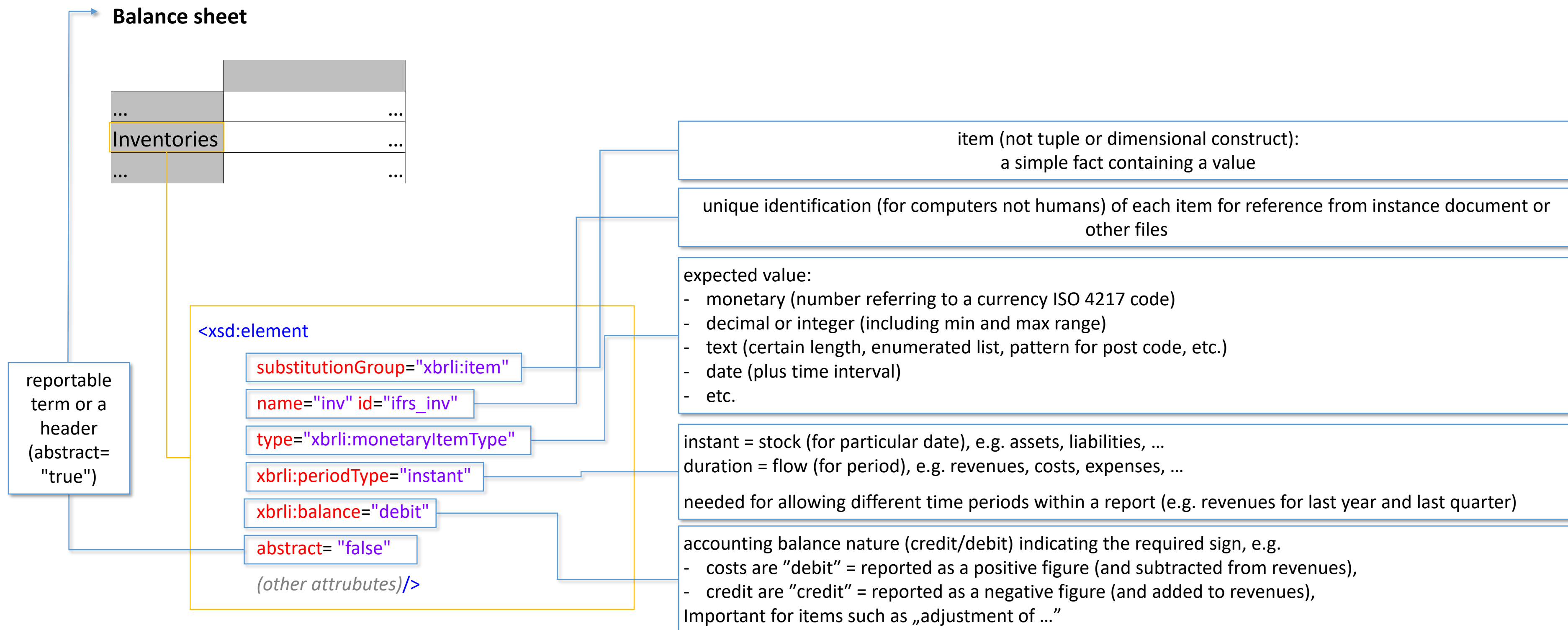
**Geographical distribution broken down by operating segments**  
*(in thousands EUR)*

Markets	Segments	Inventories	...
All regions	All segments	234 324	
	Oil	67 015	
	Coal	167 309	
Domestic	All segments	177 670	
	Oil	54 670	
	Coal	123 000	
Foreign	All segments	56 654	
	Oil	12 345	
	Coal	44 309	

XBRL Instance Document



# How to declare an item?



# How does an item instantiation look in a report?

```

<xbrli:context id="c1">
  <xbrli:entity>
    <xbrli:identifier scheme="http://standard.iso.org/iso/17442">KGCEPHLVVKVRZYO1T647</xbrli:identifier>
  </xbrli:entity>
  <xbrli:period>
    <xbrli:instant>2013-12-31</xbrli:instant>
  </xbrli:period>
</xbrli:context>
<xbrli:context id="c2">
  <xbrli:entity>
    <xbrli:identifier scheme="http://standard.iso.org/iso/17442">KGCEPHLVVKVRZYO1T647</xbrli:identifier>
  </xbrli:entity>
  <xbrli:period>
    <xbrli:instant>2014-12-31</xbrli:instant>
  </xbrli:period>
</xbrli:context>

```

see: <http://codes.eurofiling.info/>

## ABC Company Ltd

LEI: KGCEPHLVVKVRZYO1T647

### Balance sheet

(in thousands EUR)

	31 December 2013	31 December 2014
...	...	...
Inventories	214 244	234 324
...	...	...

```

<xbrli:unit id="u">
  <xbrli:measure>iso4217:EUR</xbrli:measure>
</xbrli:unit>

```

see: <http://faq.eurofiling.info/decimals/>

```

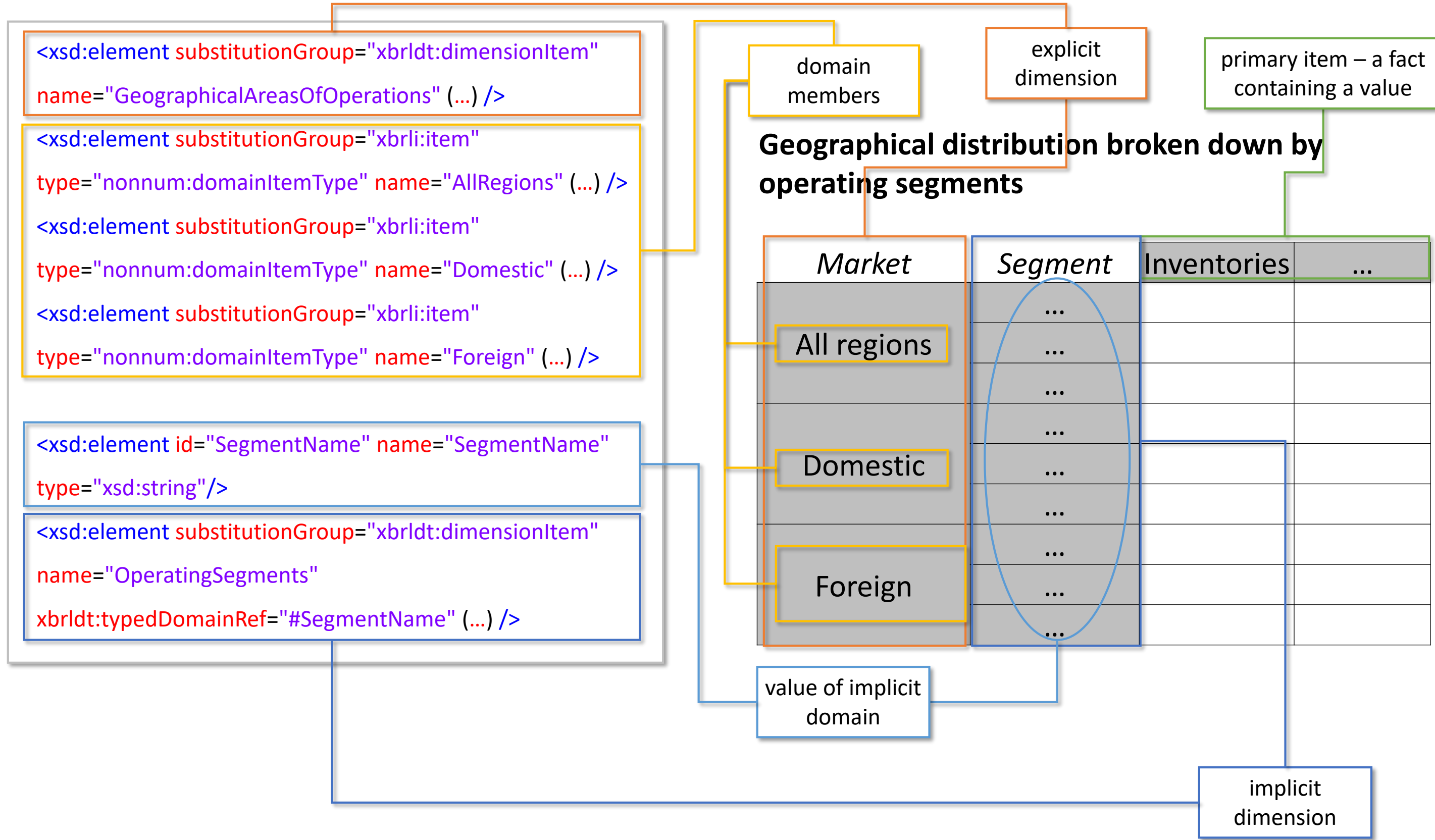
<ifrs:inv decimals="-3" contextRef="c1" unitRef="u">214244000</ifrs:inv>
<ifrs:inv decimals="-3" contextRef="c2" unitRef="u">234324000</ifrs:inv>

```

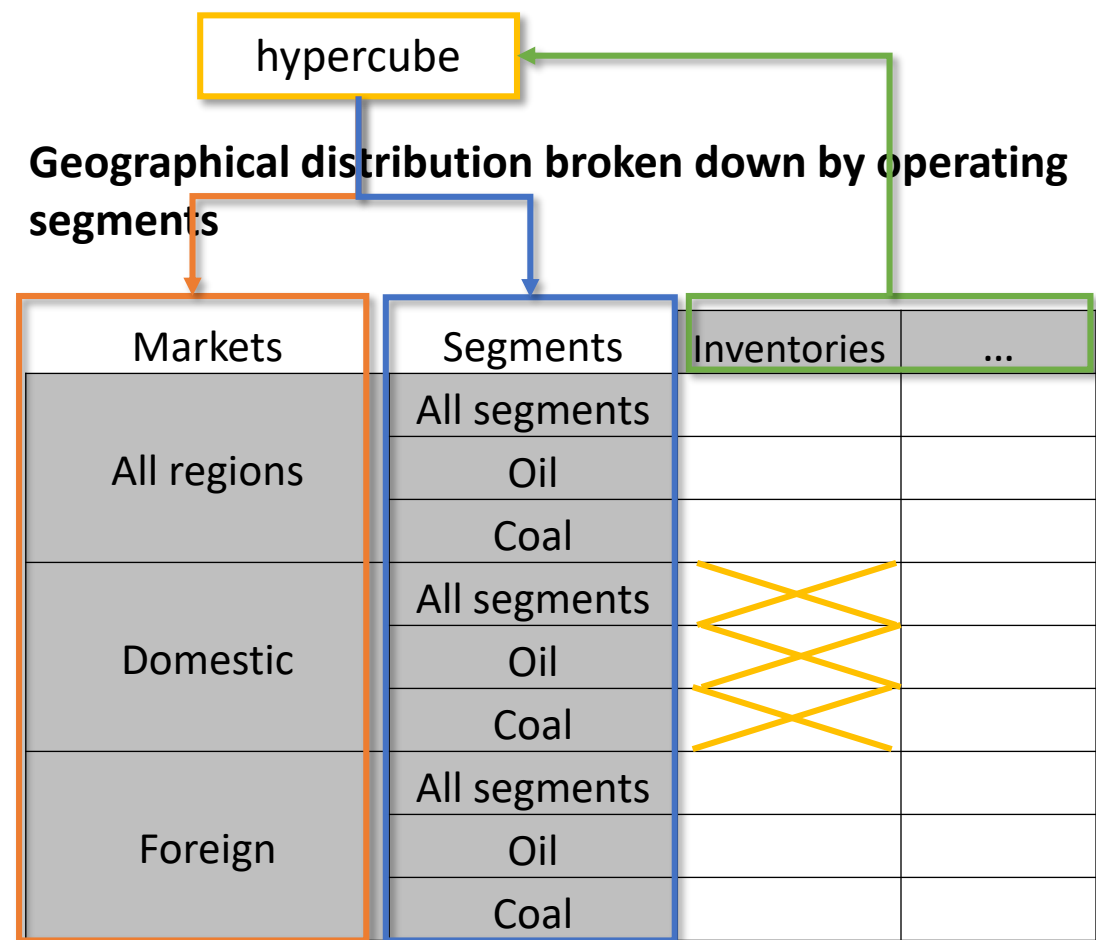


.xbrl

# How to declare dimensions and domain members?

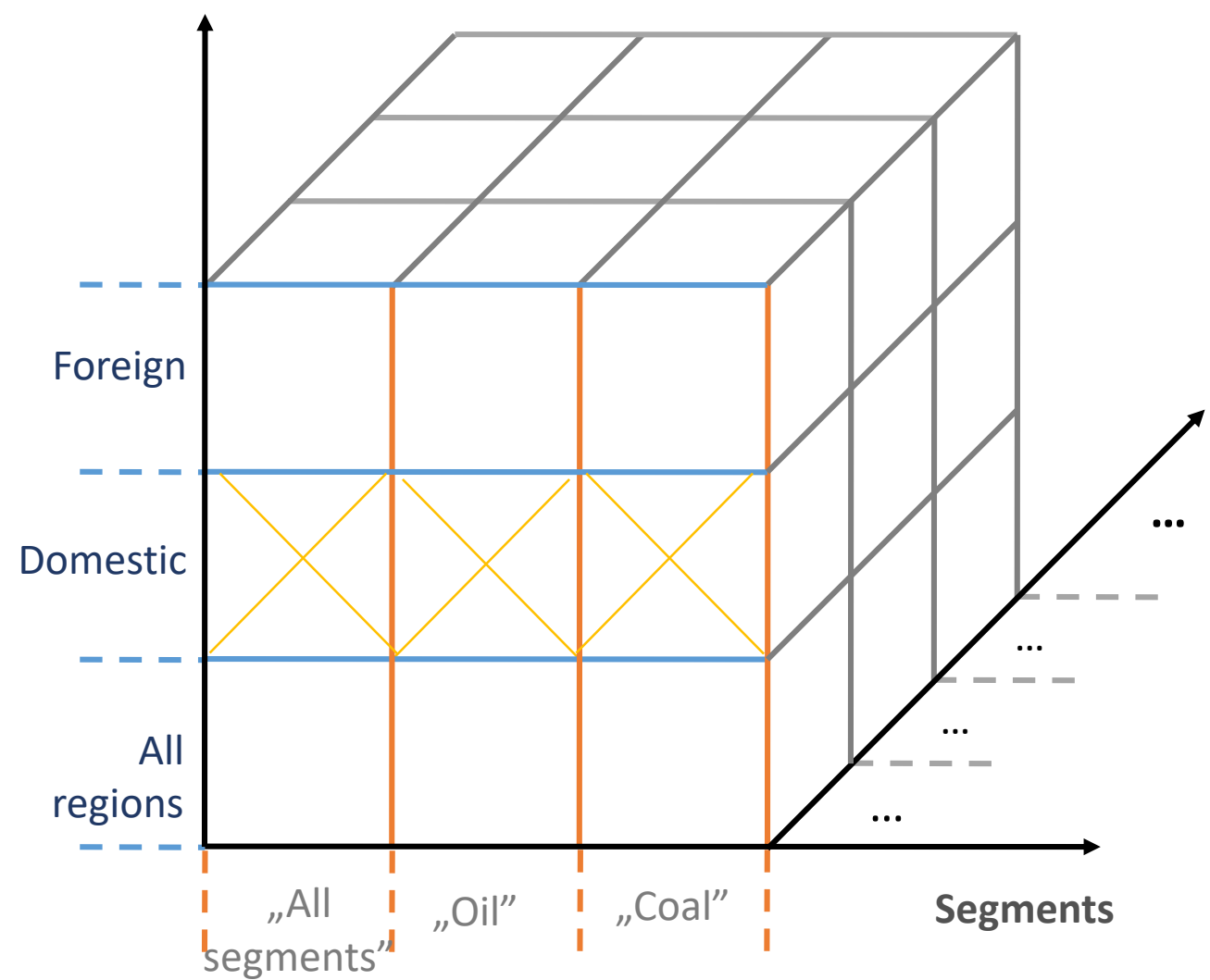


# What is a hypercube?



```
<xsd:element substitutionGroup="xbrldt:hypercubeItem"
name="ByMarketsAndOperatingSegments" (...)/>
```

Geographical distribution broken down by operating segments and ...



**Hypercube**  
 abstract concept allowing to create an ordered list of dimensions which Cartesian product of members is reportable or is prohibited for an item

Markets

item: **inventories**  
 contextual information: **entity, period, unit**

# How does a dimensional property instantiation look in a report?

```

<xbrli:context id="c3">
  <xbrli:entity>
    <xbrli:identifier scheme="http://standards.iso.org/iso/17442">KGCEPHLVVKVRZYO1T647</xbrli:identifier>
  </xbrli:entity>
  <xbrli:period>
    <xbrli:instant>2014-12-31</xbrli:instant>
  </xbrli:period>
  <xbrli:scenario>
    <xbrldi:explicitMember dimension="ifrs:GeographicalAreasOfOperations">ifrs:Foreign</xbrldi:explicitMember>
    <xbrldi:typedMember dimension="ifrs:OperatingSegments">
      <ifrs:SegmentName>Oil</ifrs:SegmentName>
    </xbrldi:typedMember>
  </xbrli:scenario>
</xbrli:context>

```

```

<xbrli:unit id="u">(...)</xbrli:unit>

```

```

<ifrs:inv decimals="-3" contextRef="c3" unitRef="u">12345000</ifrs:inv>

```

```

<ifrs:receivables decimals="-3" contextRef="c3" unitRef="u">23442000</ifrs:receivables>

```

**Geographical distribution broken down by operating segments**  
(in thousands EUR)

Markets	Segments	Inventories	Receivables
All regions	All segments	234 324	32 131
	Oil	67 015	25 675
	Coal	167 309	6 456
Domestic	All segments	177 670	5 456
	Oil	54 670	2 233
	Coal	123 000	3 223
Foreign	All segments	56 654	26 675
	Oil	12 345	23 442
	Coal	44 309	3 233



.xbrl

# How to name elements?

- each XBRL element or any XML construct (element, attribute, etc) must be named
- name and id must be **unique** in an XBRL Schema file
- there is a set of characters forbidden in element names and ids
- XML is case sensitive: `<aa> ≠ <Aa> ≠ <AA> ≠ <aA>`
- name
  - IT: as a qualified name (prefix:localName, e.g.: ifrs:Assets) used in XPath and XQuery (formula linkbase), mapping to data bases, etc
  - can be hidden from users (label is human readable)
- id
  - used to reference a concept definition via href from linkbases (relations)
  - FRTA/GFM/common rule: id = prefix\_name
  - it is not an internal code!
- contradicting requirements:
  - short (for querying, referencing, processing speed/size, readability, ...)
  - meaningful (unique identification, understanding, ...)

approaches

- LC3 (Label Camel Case Concatenation)
  - standard label trimmed of spaces and special characters, diacritic characters replaced with standard characters (ą, ę, ć, ź, ż, ó, β, ő)
  - e.g. *MovementsInPropertyPlantAndEquipment*
  - human readable and self explanatory (meaning of a concept can be guessed from a name)
  - require naming rules, e.g. *NonCurrentAssets*, *Non-currentAssets*, *AssetsNoncurrent*, *NoncurrentAssets*, ...
  - difficult to query and performance issues (larger files) e.g. *DescriptionOfAmountOfAnyGainOrLossRecognisedAsResultOfRemeasuringToFairValueEquityInterestInAcquiereeHeldByAcquirerBeforeBusinessCombinationAnd...*
  - versioning issues (if a name is changed but meaning remains the same), e.g.: *DefinedBenefitLiabilityAsset* to *LiabilityAssetOfDefinedBenefitPlans* or *MinorityInterests* to *NoncontrollingInterests* (change in IFRS Bound Volume but also bugs – inconsistent naming)
  - which language to choose?
- technical codes (e.g. EBA and EIOPA)
  - measures: letter representing data type + letter representing period type (i/d) + sequential number

Data type	Local name codification letter
xbrli:monetaryItemType	m
num:percentItemType	p
xbrli:decimalItemType	r
xbrli:integerItemType	i
xbrli:stringItemType	s
xbrli:dateItemType	d
xbrli:booleanItemType	b
restriction of xbrli:booleanItemType to "true"	t
xbrli:anyURIItemType	u
enum:enumerationItemType	e
typed domain corresponding data type	depending on typed domain type

- domain members.
  - x + sequential number
  - codes (e.g. ISO)
- domains and dimensions: two or more capital letters



# How to define a datatype?

- base data types defined in XBRL 2.1 most commonly used:
  - *xbri:monetaryItemType* – a number referring to currency identified by ISO 4217
  - *xbri:decimalItemType*, *xbri:integerItemType* – e.g. average or end of period number
  - *xbri:pureItemType* – ratios, indices (referring to none, i.e. *xbri:pure* unit)
  - *xbri:sharesItemType* – number of sharer referring to *xbri:shares* unit
  - *xbri:stringItemType* – any set of characters
  - *xbri:dateItemType* – data in RRRR-MM-DD format (and derived, e.g. *xbri:dateTimeItemType*, *xbri:gYearItemType*, *xbri:gYearMonthItemType*, ...)
  - *xbri:fractionItemType* – fraction, fact in instance document contains value of numerator and denominator, e.g. EPS = \$112333 / 30 shares
- custom data types:
  - local (for a particular concept) or global (reused for many concepts)
  - modifying predefined data types (restriction, extension)
  - enumerated lists, patterns...

- XBRL registry data types:
  - <http://xbrl.org/dtr/type/numeric-2009-12-16.xsd>
    - *num:percentItemType*
    - *num:perShareItemType*
    - *num:arealItemType*
    - *num:volumItemType*
    - *num:massItemType*
    - *num:weightItemType*
    - *num:energyItemType*
    - *num:powerItemType*
    - *num:lengthItemType*
    - *num:memoryItemType*
  - <http://xbrl.org/dtr/type/nonNumeric-2009-12-16.xsd>
    - *nonnum:domainItemType*
    - *nonnum:escapedItemType*
    - *nonnum:xmlNodesItemType*
    - *nonnum:xmlItemType*
    - *nonnum:textBlockItemType*

```
<xsd:complexType name="CountryItemType">
  <xsd:simpleContent>
    <xsd:restriction base="xbri:tokenItemType">
      <xsd:enumeration value="Poland"/>
      <xsd:enumeration value="Germany"/>
      <xsd:enumeration value="(...)" />
    </xsd:restriction>
  </xsd:simpleContent>
</xsd:complexType>
```

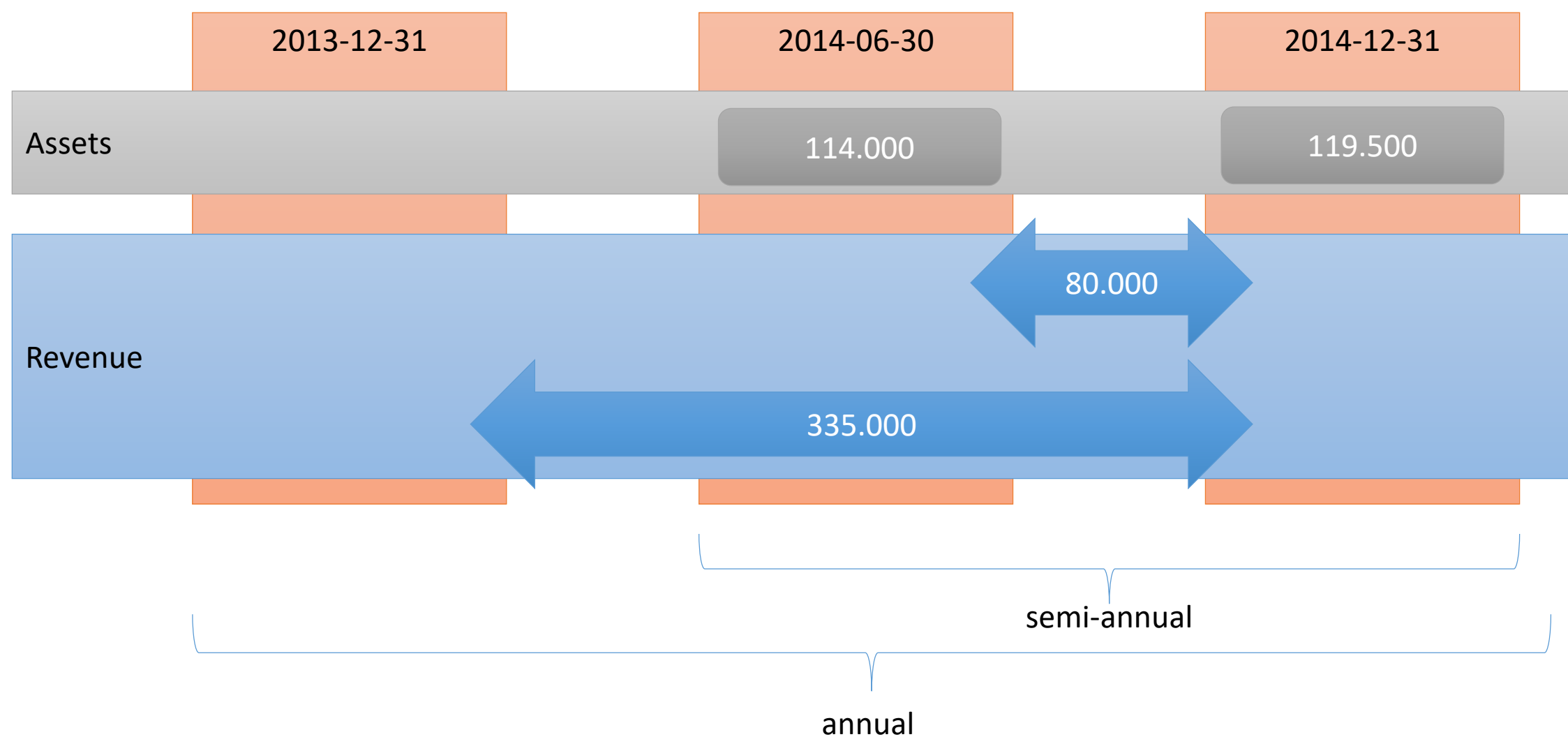
```
<xsd:complexType name="PostCodeItemType">
  <xsd:simpleContent>
    <xsd:restriction base="xbri:stringItemType">
      <xsd:pattern value="[A-Z]{2}-[0-9]{3}" />
    </xsd:restriction>
  </xsd:simpleContent>
</xsd:complexType>
```

```
<xsd:complexType name="nonNegativeMonetaryItemType">
  <xsd:simpleContent>
    <xsd:restriction base="xbri:monetaryItemType">
      <xsd:minInclusive value="0" />
    </xsd:restriction>
  </xsd:simpleContent>
</xsd:complexType>
```

# What is the period type attribute?

- attribute *periodType* distinguishes between:
  - flows (cash flows, revenue, costs, ...) - "duration" (reported „for period“)
  - stocks (assets, liabilities, ...) - "instant" (reported „as of date“)
- impossible to define cross-period checks in calculation linkbase (supported by in formula linkbase)
- alternative: everything instant + period dimension (Q, H, Y, ...)
- for other items (domain members, dimensions): unimportant

## Impossible to report data for more periods if *revenue* is described by one date



```
<xbrli:context id="c1">
```

```
(..)
```

```
<xbrli:period>
```

```
<xbrli:periodStart>2013-12-31</xbrli:periodStart>
```

```
<xbrli:periodEnd>2014-12-31</xbrli:periodEnd>
```

```
</xbrli:period>
```

```
</xbrli:context>
```

```
<xbrli:context id="c2">
```

```
(..)
```

```
<xbrli:period>
```

```
<xbrli:periodStart>2014-06-30</xbrli:periodStart>
```

```
<xbrli:periodEnd>2014-12-31</xbrli:periodEnd>
```

```
</xbrli:period>
```

```
</xbrli:context>
```

```
<eg:revenues decimals="0" contextRef="c1" unitRef="u">335000</eg:revenues>
```

```
<eg:revenues decimals="0" contextRef="c2" unitRef="u">80000</eg:revenues>
```

# What is the balance attribute?

- according to the double entry accounting rule the natural balance:
  - of assets and costs is the "debit" (Dr): increase of an asset or cost is entered on the debit side (decrease on the credit side)
  - of liabilities, equities and revenues is the "credit" (Cr): increase of an equity, liability or revenue is entered on the credit side (decrease on the debit side)
- indicates what is the **expected sign** for reported facts (plus or minus)

Assets	1200	Dt
Equity	700	Cr
Liabilities	500	Cr

Assets = Equity + Liabilities

Assets	1200	Dt
Equity	-700	Dt
Liabilities	-500	Dt

Assets = - Equity - Liabilities

Assets	2000	Cr
Equity	2200	Dt
Liabilities	-200	Cr

Assets	2000	Cr
Equity	-2200	Cr
Liabilities	-200	Cr

- best practice: natural balance (positive values expected)
  - Revenue - Costs = Profit (Loss)
  - Revenue + Costs = Profit (Loss)
- calculation linkbase checks allow for summation of primary items with the same balance nature (Dt + Dt, Cr + Cr) and subtracting concepts with opposite balance nature (Dt - Cr, Cr - Dt)
- balance attribute is required (best practices) only for *balance sheet* and *income statement* concepts (according to best practices) but may and is recommended to be used wherever applicable, however issues in case of *cash flow statement*

Dr	PPE		Cr
Bs.	123.000		
	19.000	20.000	
	15.000		
T.	34.000	20.000	T.
		137.000	Es.
	<b>157.000</b>	<b>157.000</b>	

Dr	Trade payables		Cr
		20.000	Bs.
	14.000	12.000	
	2.000		
T.	16.000	12.000	T.
Es.	16.000		
	<b>32.000</b>	<b>32.000</b>	

Account	Bs. Dr	Bs. Cr	T. Dr	T. Cr	Es. Dr	Es. Cr
PPE	123.000		34.000	20.000	137.000	
Trade Payables		20.000	16.000	12.000		16.000
...						

	Natural balance:	Expected value:	Alternative:	Expected value:
Assets of increase in assets	debit	positive or zero		
Decrease in assets	credit	positive or zero	debit	negative or zero
Liabilities or increase in liabilities	credit	positive or zero	debit	negative or zero
Decrease in liabilities	debit	positive or zero	credit	positive or zero
Equity, increase in equity	credit	positive or zero	debit	negative or zero
Decrease in equity	debit	positive or zero	credit	positive or zero
Revenue	credit	positive or zero		
Costs	debit	positive or zero	credit	negative or zero
Profit	credit	positive or zero		
Loss	debit	positive or zero	credit	negative or zero

# What are the other attributes on elements?

- abstract attribute
  - abstract attribute determines if an element can appear in an instance document
  - elements with the value "true" of abstract attribute are used for headers in hierarchical ordering of taxonomy structure for the presentation purposes and cannot be reported
  - for abstracts all other characteristics (data and period type) are not important although they should be defined consistently (based on some rules)
  - note:
    - in standard naming convention in order not to occupy unique names for meaningful concepts all abstract have added words „Presentation” or „Abstract” to their names, e.g. AssetsAbstract vs. Assets
    - similar approach applies for hypercubes, dimensions, domain members that are abstract (e.g. „Hypercube/„Table”, „Dimension”/„Axis”, „Member”)
- nillable attribute: if element can be nilled (xsi:nil) in instance document (empty content or empty tags not allowed for numeric items)
- custom attributes:
  - XBRL elements may have other than standard, i.e. custom, attributes
  - semantics ignored by unaware processors
  - example from FINREP taxonomy:

```
<xs:element
  name="di253" id="eba_di253"
  xbrli:periodType="instant"
  substitutionGroup="xbrli:item"
  nillable="true"
  model:domain="eu_exp:GA"
  type="xbrli:QNameItemType"
  model:creationDate="2011-01-01"
  model:modificationDate="2012-10-31"
  model:fromDate="2012-05-12" />
```

Statement of financial position, current/non-current classification	
<b>Assets</b>	
<b>Non-current assets</b>	
Property, plant and equipment	
Investment property	
Goodwill	
Intangible assets other than goodwill	
Investment accounted for using equity method	
Biological assets	
Deferred tax assets	
Other non-current financial assets	
Other non-current non-financial assets	
Total non-current assets	
<b>Current assets</b>	
Inventories	
Trade and other receivables	
Current tax assets	

# What are the linkbases?

Additional information on business terms in linkbases:

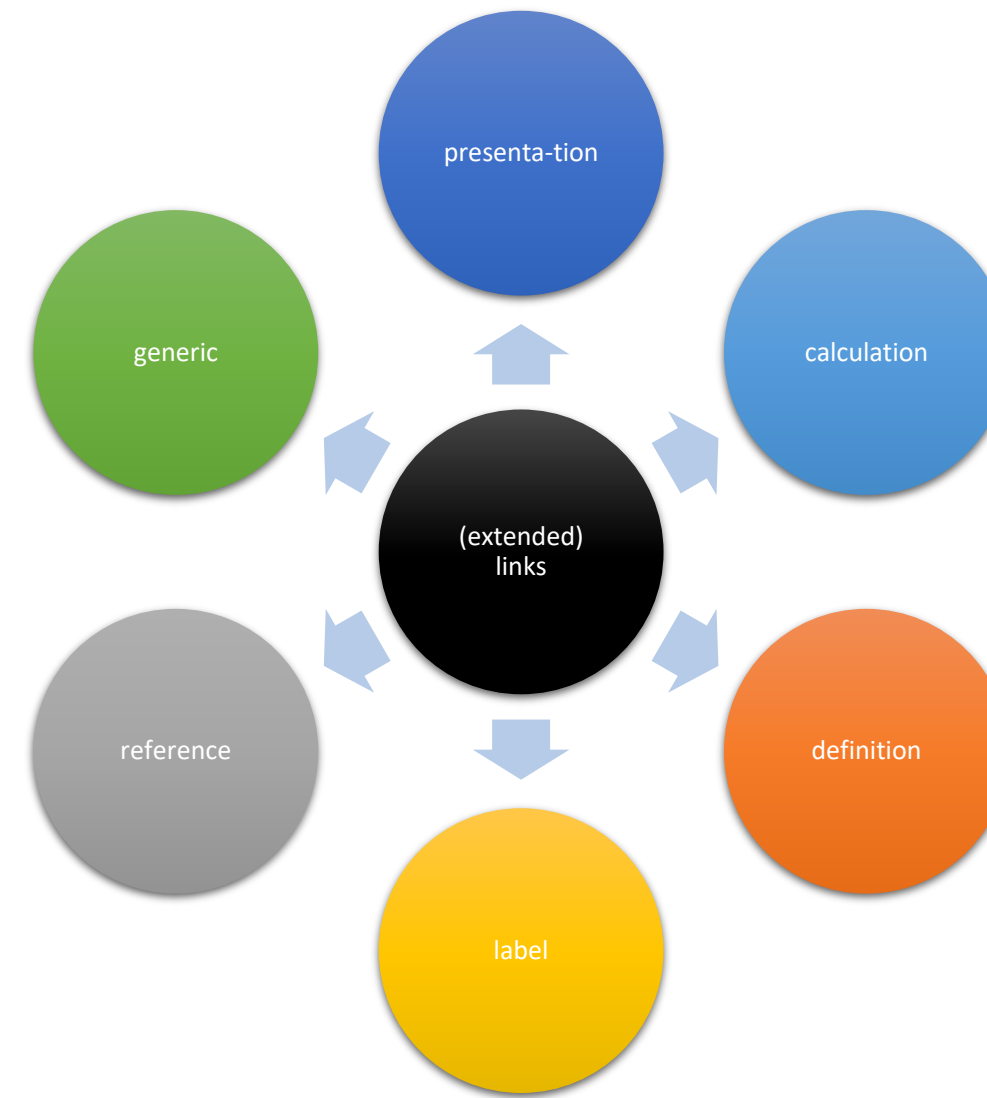
Inventories are translated into Polish as „Zapasy” and in German as „Vorräte”.

Measurement method of inventories as defined by IFRSs is described by IAS 2, paragraph 9.

Inventories are reported in Statement of financial position in a group of Current Assets and in notes in Disclosures of current assets.

Inventories are sum of Raw materials, Merchandise, Production supplies, Work in progress, Finished goods and Other inventories.

Inventories must be reported in the breakdown for segments and geographical areas where company operates.



- additional documentation:
  - label (multilingual, contextual)
  - references (to legal acts, guidelines, ...)
  - generic (further customization)
- relations (of different kinds and nature) between concepts:
  - presentation and definition (browsing of taxonomy)
  - calculation (aggregations)
  - generic (further customization)
- dimensional information: definition (data model)
- any other: generic (further customization)

Technically:

- start and end with `<link:linkbase>` tag
- linkbases may be „embedded in” XML Schema file or instance document (report); not recommended (decreases extensibility and flexibility as well as possibility of modularization - division into files has secondary priority)
- if separate file then it’s extension is: `.xml`

schema file name.xsd

```
<xsd:schema>
  <link:linkbase>
    _____
  </link:linkbase>
  _____
  _____
</xsd:schema>
```

Taxonomy schema with embedded linkbase

schema file name.xsd

```
<xsd:schema>
  <link:linkbaseRef ... />
  _____
  _____
  _____
</xsd:schema>
```

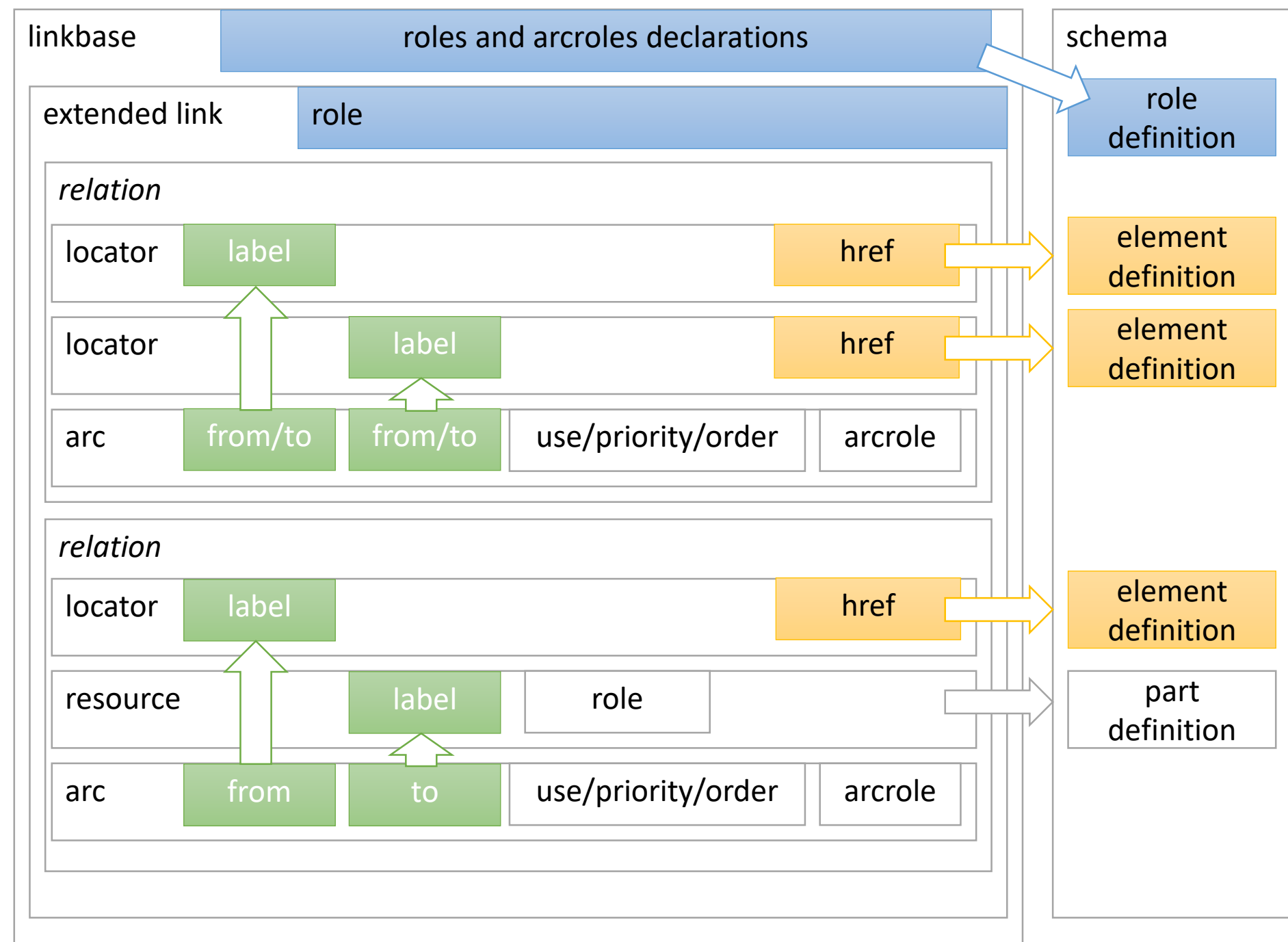
Taxonomy schema references a separate taxonomy linkbase file

linkbase file name.xml

```
<link:linkbase>
  _____
  _____
</link:linkbase>
```

# What constructs are used in linkbases?

- **linkbase** – contains **relations** that are usually gathered in **sets**
- **extended link** – set of **relations** representing particular piece of a report (e.g. statement or disclosure) „named” by a **role**



- **relation** – consists of **two locators** or **one locator and one resource** or **two resources** and an **arc** which indicates the type of relation
- **locator** – points to an element defined in XBRL Schema file (*or to resource defined in another linkbase*) for which it is a local representation
- **resource** – a label, a reference, etc of a particular type
- **arc** – connects two locators or a locator and a resource or two resources
- **arcrole** – describes the type of a relation
- **role** – characteristics/type of an extended link or a resource

# How do linkbases apply XLink?

linkbases make use of XML technologies:

- **XLink** (XML Linking Languages) which enables creating hyperlinks in XML documents - **xlink:href**
- **XPointer** (XML Pointing Languages) which is used for finding fragments inside of XML and XBRL documents (e.g. element definitions in XBRL Schema files), e.g. **#Assets**

```
<xsd:element id="Assets" (...)/>
<xsd:element id="CurrentAssets" (...)/>
```

locator: points to an element defined in XBRL Schema and assigns it with a local name (label)

```
<loc (...) xlink:href="...xsd#Assets"
  xlink:label="Assets_Locator"/>
```

```
<loc (...) xlink:href="...xsd#CurrentAssets"
  xlink:label="CurrentAssets_Locator"/>
```

```
<(..)Arc (...) xlink:arcrole="(...)"
  xlink:from="Assets_Locator" xlink:to="CurrentAssets_Locator"/>
```

relations in linkbases

arc linking locators and/or resources and defining the type of relation

```
<loc (...) xlink:href="...xsd#CurrentAssets"
  xlink:label="CurrentAssets_Locator"/>
```

```
<label (...) xlink:role="(...)"
  xlink:label="CurrentAssets_Label" xml:lang="en">Current Assets</label>
```

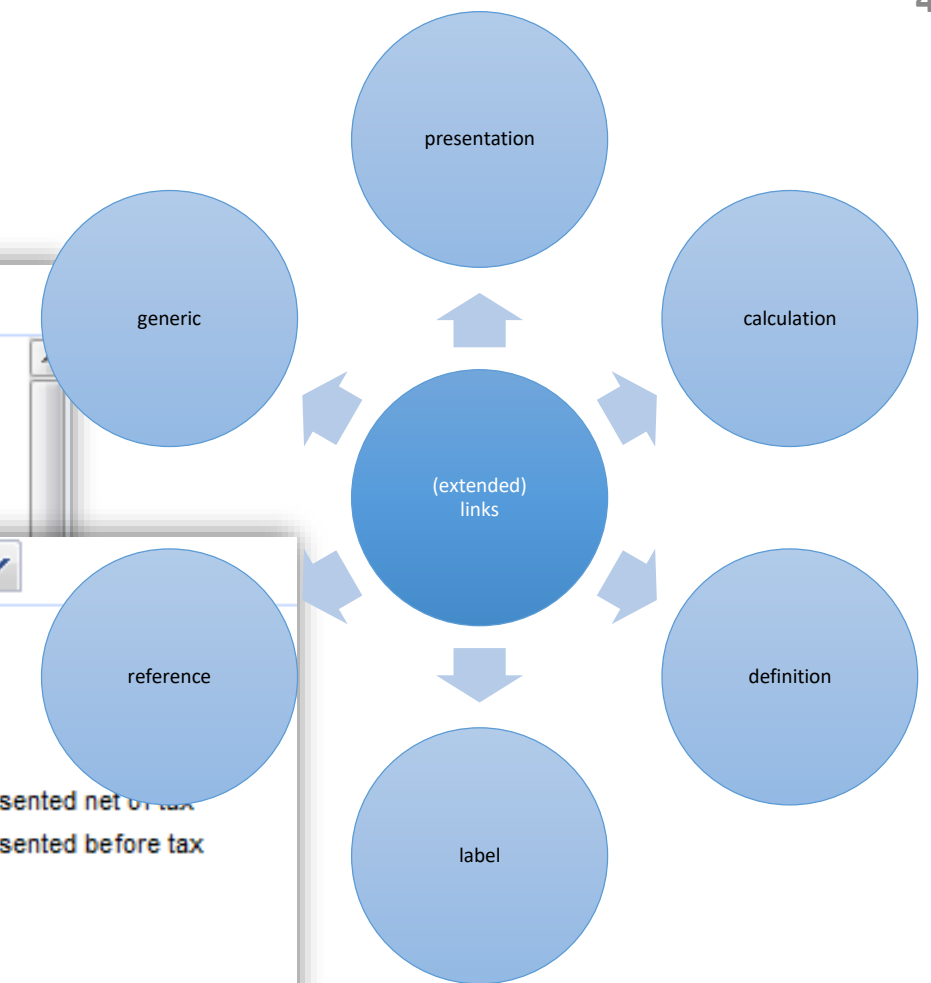
```
<(..)Arc (...) xlink:arcrole="(...)"
  xlink:from="CurrentAssets_Locator" xlink:to="CurrentAssets_Label"/>
```

resource (e.g. label or reference)

# What is an Extended Link Role (ELR)?

- gathering relations that have something in common, e.g.:
  - hierarchy of concepts in Income statement
  - labels to be used for concepts in Balance sheet
  - set of business rules applicable for a particular table (e.g. CR-SA)
  - ...
- technically:
  - predefined (standard):
    - XBRL 2.1: <http://www.xbrl.org/2003/role/link>
    - Generic link: <http://www.xbrl.org/2008/role/link>
  - custom:
    - definition in XBRL schema:
      - roleURI, id – identification and linking
      - definition – human readable name (lack of mechanism for translation by extension taxonomies hence generic labels used – e.g. IFRS taxonomy; already supported by software)
      - usedOn – indicates type of extended link (or locator/resource – TBD later) where the role can be applied (best practice: allow all)
    - linked to a generic label
    - referenced from a linkbase

The screenshot displays two overlapping windows from an XBRL software application. The top window is titled 'Presentation' and shows a list of financial statement items with their respective codes and descriptions. The bottom window is titled 'Calculation' and shows a similar list of items, including various financial statements and notes. Both windows have a 'Lang' dropdown menu set to 'en'. The software interface is designed to allow users to navigate and view different aspects of financial data.





# What is a label linkbase?

- human readable description of an XBRL element; elements' names can be effective for consuming applications but unreadable for the taxonomy users, e.g.:
  - StatementThatFinancialStatementsAndCorrespondingFiguresForPreviousPeriodsHaveBeenRestatedForChangesInPurchasingPower
  - mi20
- XBRL enables assigning many different labels for each one element:
  - depending on context (type of relationship and placement of an element in a financial statement)
  - depending on language used
  - containing documentation
  - [http://www.xbrl.org/Specification/XBRL-2.1/REC-2003-12-31/XBRL-2.1-REC-2003-12-31+corrected-errata-2013-02-20.html#\\_5.2.2.2](http://www.xbrl.org/Specification/XBRL-2.1/REC-2003-12-31/XBRL-2.1-REC-2003-12-31+corrected-errata-2013-02-20.html#_5.2.2.2)
- labelling conventions, e.g. <http://www.ifrs.org/XBRL/IFRS-Taxonomy/Documents/ITG%202013%20complete.pdf> (Appendix C)

```

<label (...) xml:lang="en">Assets</label>
<label (...) xml:lang="de">Vermögenswerte</label>
<label (...) xml:lang="es">Activos</label>
<label (...) xml:lang="pl">Aktywa</label>
        
```

## Equity

Labels		
Type	Lang	Label
Standard Label	en	Equity
Period Start Label	en	Equity at beginning of period
Period End Label	en	Equity at end of period

```

Total <label (...) xlink:role="http://www.xbrl.org/2003/role/label"
      xml:lang="en">Equity</label>
      <label (...) xlink:role="http://www.xbrl.org/2003/role/periodStartLabel"
      xml:lang="en">Equity at beginning of period</label>
      <label (...) xlink:role="http://www.xbrl.org/2003/role/periodEndLabel"
      xml:lang="en">Equity at end of period</label>
      <label (...) xlink:role="http://www.xbrl.org/2003/role/totalLabel"
      xml:lang="en">Total equity</label>
        
```

# What is a reference linkbase?

- legal basis for concepts defined by a taxonomy (concepts without legal basis should not be created e.g. their meaning may be unclear for filers)
- examples
  - IFRS taxonomy refers to IFRS Bound Volume (book)
  - COREP taxonomy refers to
    - EU Directive (in the CEBS version)
    - local regulations (in national extensions of COREP)
- reference linkbase does not contain text of the regulations but only the reference to their structure (paragraph, clause, point ...) [but: text of the regulation can be embedded in label linkbase as documentation]

## „Inventories“



Disclosure Reference	Name	IAS
	Number	2
	IssueDate	2011-01-01
	Paragraph	36
	Subparagraph	b
	URI	<a href="http://eifrs.ifrs.org/eifrs/XBRL?type=IAS&amp;num=2&amp;date=2011-03-25&amp;anchor=para_36_b&amp;doctype=Standard">http://eifrs.ifrs.org/eifrs/XBRL?type=IAS&amp;num=2&amp;date=2011-03-25&amp;anchor=para_36_b&amp;doctype=Standard</a>
	URIDate	2011-03-25
Example Reference	Name	IAS
	Number	1
	IssueDate	2011-01-01
	Paragraph	68
	URI	<a href="http://eifrs.ifrs.org/eifrs/XBRL?type=IAS&amp;num=1&amp;date=2011-03-25&amp;anchor=para_68&amp;doctype=Standard">http://eifrs.ifrs.org/eifrs/XBRL?type=IAS&amp;num=1&amp;date=2011-03-25&amp;anchor=para_68&amp;doctype=Standard</a>
	URIDate	2011-03-25

[L-2.1-REC-2003-12-](#)

- types of referenc  
[31+corrected-err](#)

- structure of references: [www.xbrl.org/2006/ref-2006-02-27.xsd](http://www.xbrl.org/2006/ref-2006-02-27.xsd)

- extending the structure:

```
<xsd:element name="Directive" type="xsd:string" substitutionGroup="link:part"/>
<xsd:element name="Table" type="xsd:positiveInteger" substitutionGroup="link:part"/>
<xsd:element name="Letter" type="custom:a2z" substitutionGroup="link:part"/>
```

## IAS 1

- 68 The operating cycle of an entity is the time between the acquisition of assets for processing and their realisation in cash or cash equivalents. When the entity's normal operating cycle is not clearly identifiable, it is assumed to be twelve months. Current assets include assets (such as inventories and trade receivables) that are sold, consumed or realised as part of the normal operating cycle even when they are not expected to be realised within twelve months after the reporting period. Current assets also include assets held primarily for the purpose of trading (examples include some financial assets classified as held for trading in accordance with IAS 39) and the current portion of non-current financial assets.

## IAS 2

- 36 **The financial statements shall disclose:**
- the accounting policies adopted in measuring inventories, including the cost formula used;
  - the total carrying amount of inventories and the carrying amount in classifications appropriate to the entity;

```
<link:reference (...)>
  xlink:role="http://www.xbrl.org/2003/role/disclosureRef">
  <ref:Name>IAS</ref:Name>
  <ref:Number>1</ref:Number>
  <ref:IssueDate>2011-01-01</ref:IssueDate>
  <ref:Paragraph>68</ref:Paragraph>
  <ref:URI>http://eifrs.ifrs.org/eifrs/XBRL(...)</ref:URI>
  <ref:URIDate>2011-03-25</ref:URIDate>
</link:reference>
<link:reference (...)> xlink:role="http://www.xbrl.org/2003/role/exampleRef">
  <ref:Name>IAS</ref:Name>
  <ref:Number>2</ref:Number>
  <ref:IssueDate>2011-01-01</ref:IssueDate>
  <ref:Paragraph>36</ref:Paragraph>
  <ref:Subparagraph>b</ref:Subparagraph>
  <ref:URI>http://eifrs.ifrs.org/eifrs/XBRL(...)</ref:URI>
  <ref:URIDate>2011-03-25</ref:URIDate>
</link:reference>
```

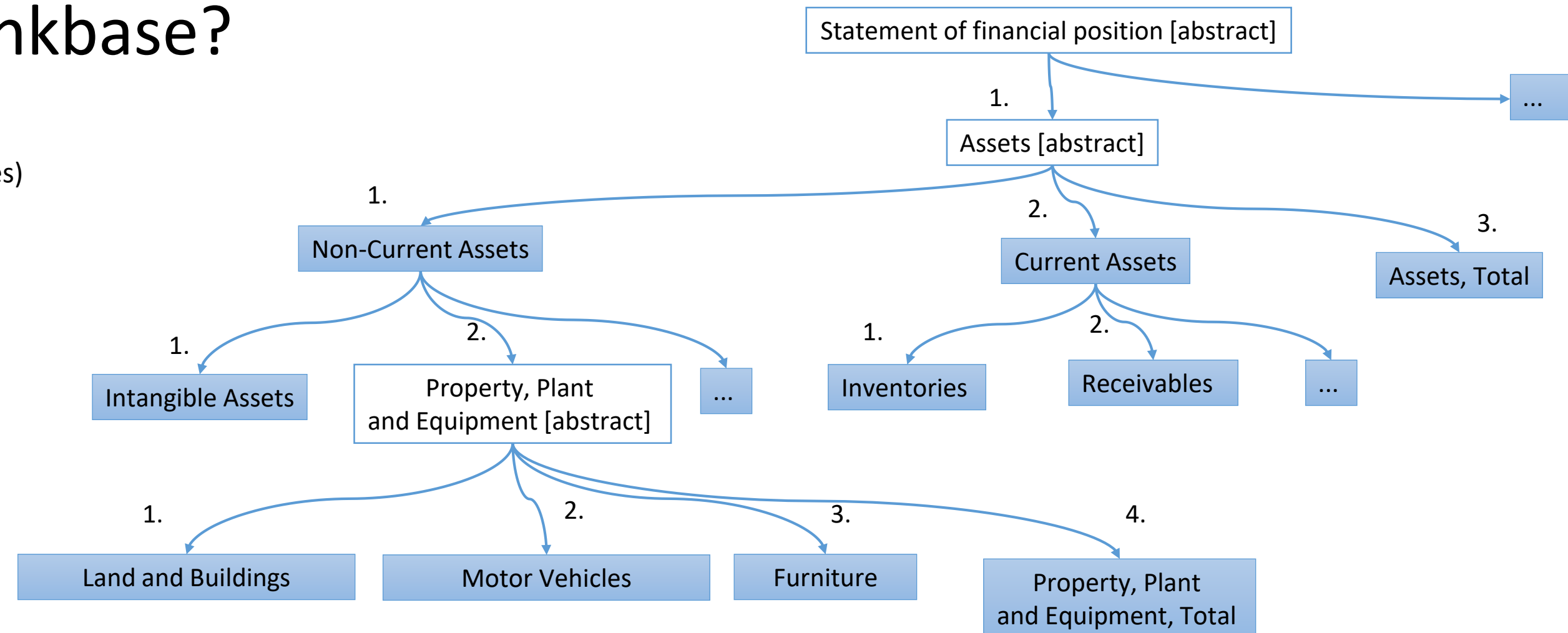
# What is a presentation linkbase?

- facilitates browsing of taxonomy content
- hierarchical dependencies between concepts (graphs/trees)

## Statement of financial position

Statement of financial position	
<i>Assets</i>	
Non-Current Assets	X
Intangible Assets	X
<i>Property, Plant and Equipment</i>	
Land and Buildings	X
Motor Vehicles	X
Furniture	X
Property, Plant and Equipment, Total	X
...	
Current Assets	X
Inventories	X
Receivables	X
...	
Assets, Total	X

- indicates reportable information (informative, no validation)
- it is NOT a visualization of a report however it is quite often used for this purpose
- application of presentation linkbase in EBA and EIOPA taxonomies: hierarchical relationship of dictionary elements (metrics, domain members)



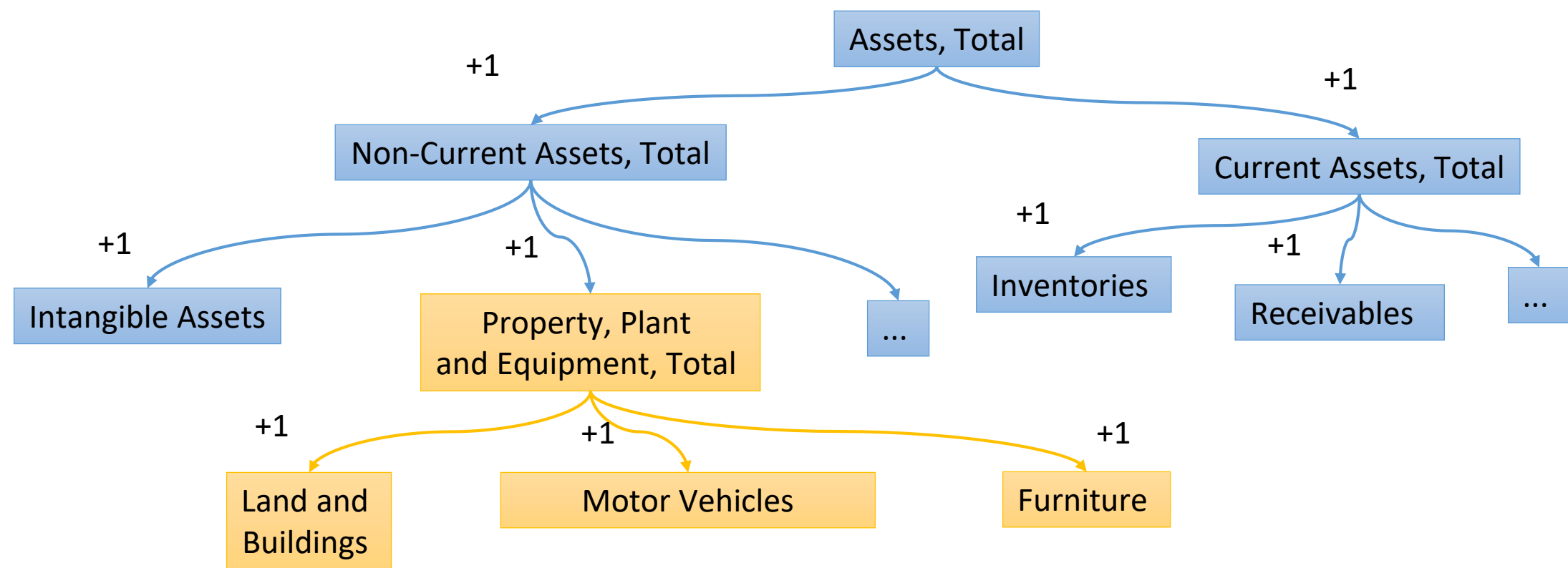
```

<loc xlink:type="locator"
  xlink:href="schema.xsd#Assets"
  xlink:label="Assets_Locator"/>
<loc xlink:type="locator"
  xlink:href="schema.xsd#CurrentAssets"
  xlink:label="CurrentAssets_Locator"/>
<presentationArc xlink:type="arc"
  xlink:arcrole="http://www.xbrl.org/2003/arcrole/parent-child"
  xlink:from="Assets_Locator" xlink:to="CurrentAssets_Locator"
  order="2"
  use="optional"/>

```

# What is a calculation linkbase (1)?

- defines validity checks to be performed on the content of reports
- created in a 'tree-like' fashion according to the rule: subelements multiplied by a weight are summed-up in order to check validity of the value of the parent element:  $X = \text{multiplication factor} \times Y$ , e.g.  $\text{Tax} = 0,19 \times \text{Income}$ )



Presentation linkbase		Calculation linkbase	
Property, Plant and Equipment		Property, Plant and Equipment, Total	
Land and Buildings		Land and Buildings	+1
Motor Vehicles		Motor Vehicles	+1
Furniture		Furniture	
Property, Plant and Equipment, Total			

```

<loc (...) xlink:href="schema.xsd#GrossProfitLoss" xlink:label="GrossProfitLoss_Locator"/>
<loc (...) xlink:href="schema.xsd#SalesRevenue" xlink:label="SalesRevenue_Locator"/>
<loc (...) xlink:href="schema.xsd#CostOfSales" xlink:label="CostOfSales_Locator"/>
<calculationArc (...)
  xlink:arcrole="http://www.xbrl.org/2003/arcrole/summation-item"
  xlink:from="GrossProfitLoss_Locator" xlink:to="SalesRevenue_Locator"
  order="1" weight="1" use="optional"/>
<calculationArc (...)
  xlink:arcrole="http://www.xbrl.org/2003/arcrole/summation-item"
  xlink:from="GrossProfitLoss_Locator" xlink:to="CostOfSales_Locator"
  order="2" weight="-1" use="optional"/>
  
```

same entity, period and unit or measure

multiplication factor

# What is a calculation linkbase (2)?

- limited application:

- Cr + Cr, Cr - Dt, Dt - Cr, Dt + Dt
- only numeric data in a single report
- no cross-entity, no cross-period (stock + flow), no cross-unit (EUR, shares, ...) or cross-dimension
- it doesn't work when the resulting or all contributing facts are missing in a report

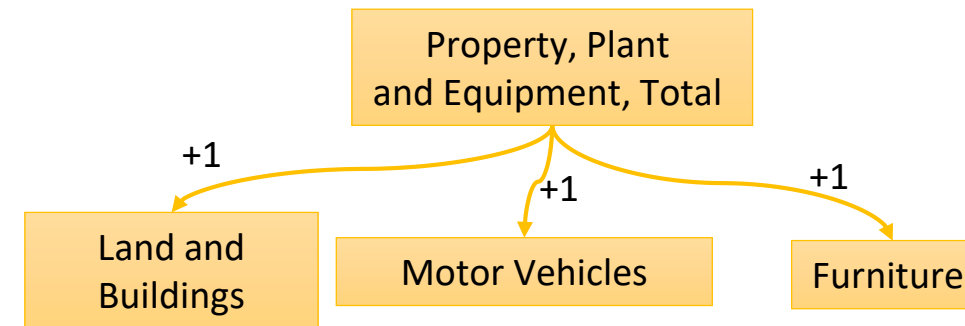
- formula specification far more powerful:

- fallback values
- cross-entity/period/dimension/unit
- creation of new facts from reported data

- scale** of reporting (thousands, millions, ...) is assigned in instance document by a reporting entity (although it is possible to enforce the required precision in taxonomies or by adding additional rules to validators or using formula specification)

- application of calculation linkbase in EBA and EIOPA

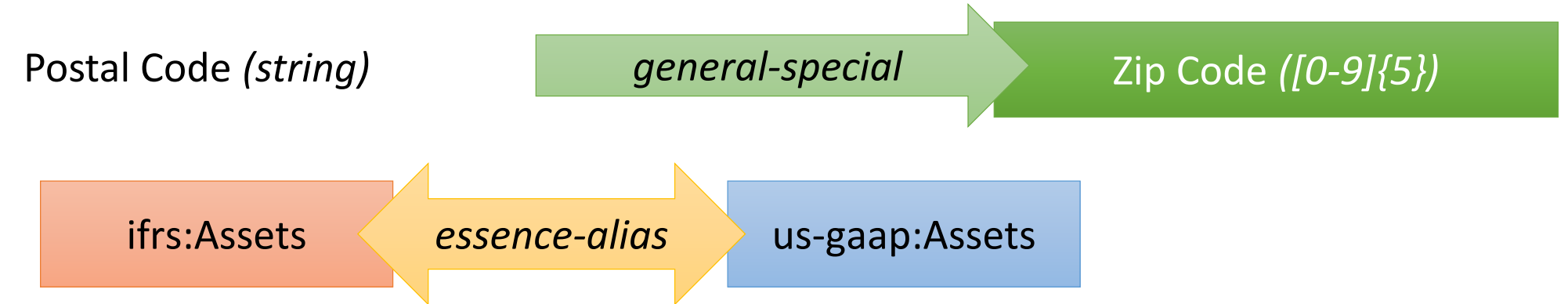
- basic arithmetic relationships between dictionary items (metrics, domain members)
- uses three types of aggregation relationships (<http://www.eurofiling.info/eu/fr/xbml/ext/model.xsd>):
  - complete-breakdown:  $a = b + c$
  - partial-breakdown:  $a \geq b + c$
  - superset-breakdown:  $a \leq b + c$



Calculation linkbase		Validation					
Property, Plant and Equipment, Total		90	90		90	0	90
Land and Buildings	+1	40		40	0	40	40
Motor Vehicles	+1	30		30	0	30	
Furniture	+1	20		20	0	20	
		OK	OK	OK	Error	Error	Error

# What is a definition linkbase (according to XBRL 2.1 specification)?

- *general-special* relationship (special case of an element, usually with a datatype restriction)
- *essence-alias* relationship (elements with the same meaning and value)
- *requires-element* relationship (requirement for disclosing a value for an element if the other element is reported with a value)



[822100] Notes - Property, plant and equipment

[210000] Consolidated statement of financial position, current/non-current classification	
Statement of financial position, current/non-current classification	
Assets	
Non-current assets	
Property, plant and equipment	X
Investment property	X
Goodwill	X
Intangible assets other than goodwill	X

Disclosure of property, plant and equipment [explanatory]	
Explanation of property, plant and equipment, pledged as security	[string]
Explanation of expenditures recognised for constructions	[string]
Explanation of contractual commitments for acquisition of property, plant and equipment	[string]
Explanation of amount of compensation from third parties for items of property, plant and equipment	[string]
Explanation of property, plant and equipment, temporarily idle	[string]
Explanation of gross carrying amount of fully depreciated property, plant and equipment	[string]
Explanation of carrying amount of property, plant and equipment retired from active use	[string]
Description of fair value of property, plant and equipment materially different from carrying amount	[string]

same definition but different content model; e.g. for extension purposes (element *<redefine>* is prohibited by XBRL 2.1 spec)

taxonomy 1

Deposits		
Description	Amount	Effective Rate of Return
...	...	...

taxonomy 2

Deposits			
Description	Amount	Effective Rate of Return	Date
...	...	...	...

# How to represent information requirements in a taxonomy according to XBRL 2.1? - *Use case 1*

	Current Year	Previous Year
<b>Assets</b>		
Non-Current Assets	X	X
Current Assets	X	X
<b>Assets, Total</b>	<b>X</b>	<b>X</b>

[http://\(..\)/role/BalanceSheet-Assets](http://(..)/role/BalanceSheet-Assets)

Assets [abstract]

Non-Current Assets

Current Assets

Assets, Total

[http://\(..\)/role/BalanceSheet-Assets](http://(..)/role/BalanceSheet-Assets)

Assets, Total

Non-Current Assets +1

Current Assets +1

# How to represent information requirements in a taxonomy according to XBRL 2.1? - *Use case 2*

	Beginning Balance	Changes	Changes		Ending Balance
			Increases	Decreases	
Land	X	X	X	X	X
Machinery	X	X	X	X	X
<b>PPE</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>

[http://\(...\)/role/StatementOfChangesInPPE](http://(...)/role/StatementOfChangesInPPE)

Statement of Changes in PPE [abstract]

Movements in Land [abstract]

Land, Beginning Balance

Total Changes, Land

Increases, Land

Decreases, Land

Land, Ending Balance

Movements in Machinery [abstract]

Machinery, Beginning Balance

Total Changes, Machinery

Increases, Machinery

Decreases, Machinery

Machinery, Ending Balance

Movements in PPE [abstract]

PPE, Beginning Balance

Total Changes, PPE

Increases, PPE

Decreases, PPE

PPE, Ending Balance

[http://\(...\)/role/StatementOfChangesInPPE2](http://(...)/role/StatementOfChangesInPPE2)

Statement of Changes in PPE [abstract]

Beginning Balance [abstract]

Land, Beginning Balance

Machinery, Beginning Balance

PPE, Beginning Balance

Total Changes [abstract]

Total Changes, Land

Total Changes, Machinery

Total Changes, PPE

Increases [abstract]

Increases, Land

Increases, Machinery

Increases, PPE

Decreases [abstract]

Decreases, Land

Decreases, Machinery

Decreases, PPE

Ending Balance [abstract]

Land, Ending Balance

Machinery, Ending Balance

PPE, Ending Balance

[http://\(...\)/role/StatementOfChangesInPPE](http://(...)/role/StatementOfChangesInPPE)

PPE

Land +1

Machinery +1

Changes, PPE

Changes, Land +1

Changes, Machinery +1

Increases, PPE

Increases, Land +1

Increases, Machinery +1

Decreases, PPE

Decreases, Land +1

Decreases, Machinery +1

[http://\(...\)/role/StatementOfChangesInPPE2](http://(...)/role/StatementOfChangesInPPE2)

Changes, PPE

Increases, PPE +1

Decreases, PPE -1

Changes, Land

Increases, Land +1

Decreases, Land -1

Changes, Machinery

Increases, Machinery +1

Decreases, Machinery -1



# How to represent information requirements in a taxonomy according to XBRL 2.1? - *Use case 3*

	Total	North America		Rest of the World
		USA	Canada	
Revenue	X	X	X	X
Assets	X	X	X	X

[http://\(...\)/role/GeographicalDistributionOfRevenueAndAssets](http://(...)/role/GeographicalDistributionOfRevenueAndAssets)

Geographical distribution of revenue and assets [abstract]

Revenue [abstract]

Total Revenue

Revenue from North America

Revenue from USA

Revenue from Canada

Revenue from rest of the World

Assets [abstract]

Total assets

Assets in North America

Assets in USA

Assets in Canada

Assets in rest of the World

[http://\(...\)/role/GeographicalDistributionOfRevenueAndAssets](http://(...)/role/GeographicalDistributionOfRevenueAndAssets)

Revenue

Revenue from North America

+1

Revenue from USA

+1

Revenue from Canada

+1

Revenue from rest of the World

+1

Assets

Assets in North America

+1

Assets in USA

+1

Assets in Canada

+1

Assets in rest of the World

+1

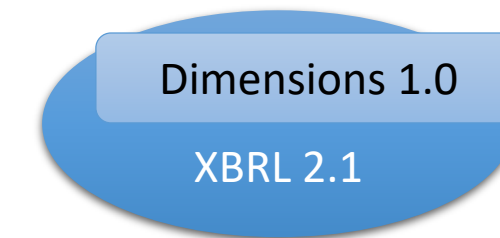
# What is the XBRL Dimensions 1.0 specification?

## XBRL 2.1 (2003-12-31):

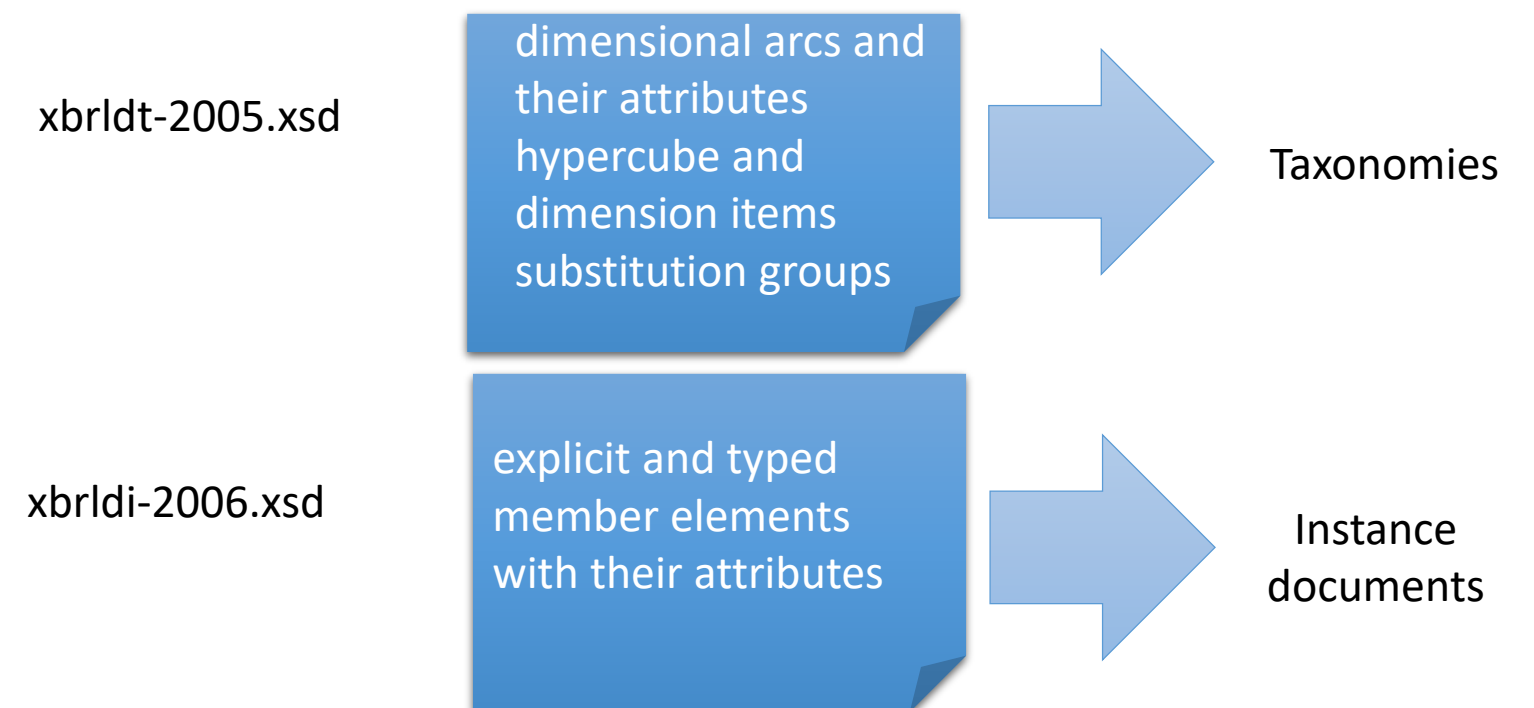
- taxonomy:
  - definition of concepts
  - labels and references
  - relations (gathered in sets - ELRs)
    - presentation (parent-child)
    - calculation (summation-item)
    - definition (general-special, essence-alias, requires-element, similar-tuples)
- instance document:
  - simple fact: value of a concept in a context (entity, period, ...) and unit of measure
  - compound fact: a concept that groups pieces of information (e.g. Directors information comprising of: Director name, Director position, Director remuneration)
- quasi „dimensions“
  - reporting entity
  - reporting date or period
  - units of measure
  - container for any other construct
    - difficulty in indicating in taxonomies relations between items and assumed dimensional information
    - dimensional information is not constructed with XBRL functionality (i.e. relations, labels, references)

## XBRL Dimensions 1.0 recommendation: 2006-09-18

- motivation: modelling of databases in sales/production departments (e.g. by regions, by products, by clients, etc.)
- modular extension to XBRL Specification 2.1 (backwards comparability)



- definition of syntax and rules for providing dimensional contextual information with use of XBRL constructs and functionality in taxonomies and instance documents: elements, relations, labels, references, ...



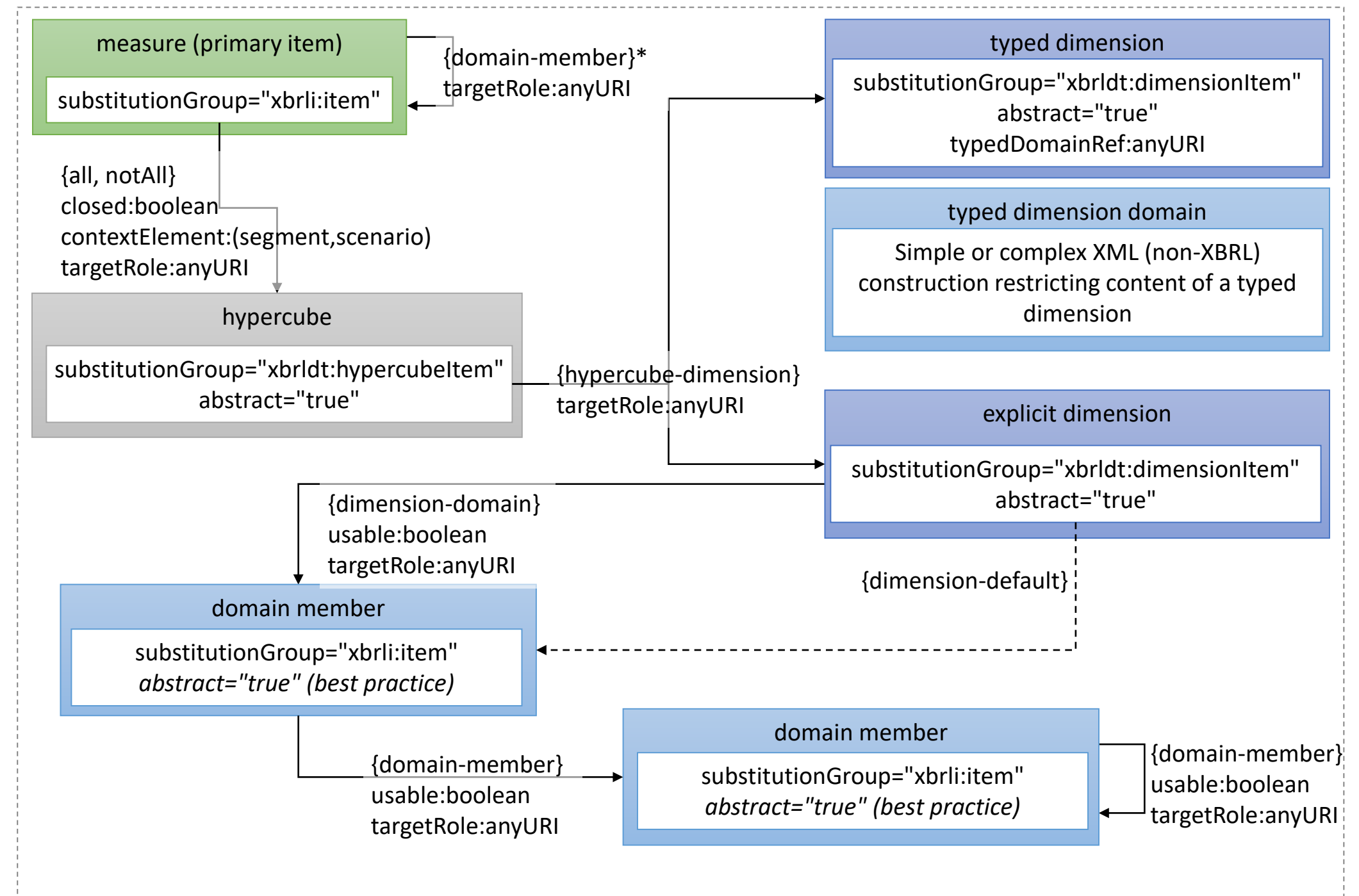
# What are the components and relationships used by XBRL Dimensions?

## components

- primary item, measure
  - basic financial/accounting terms that can be reported with dimensional information in context in instance document
  - e.g. Carrying amount of assets, Revenues of current period, ...
- domain
  - complete breakdown of a certain type; listed in the taxonomy (explicit) or constrained by a data type (typed)
  - e.g. list of financial instruments, list of economy sectors, list of continents/countries/cities, time intervals, ...
- domain member
  - each enumerated value of an explicit domain
  - e.g. Instruments total, Equity instruments, Debt securities, ..., All sectors, Central banks, Governments, ...
- dimension
  - a view on a breakdown (resulting in dimensional context for a measure) e.g. Instrument held, Instrument issued, Original maturity, Remaining maturity, Counterparty sector, ...
- hypercube
  - abstract concept enabling to create an ordered list of dimension member/value pairs which Cartesian product of members constitutes (or is prohibited for) for a primary item (or a set of primary items)
  - e.g. By instrument held and issuing counterparty sector, ...

## relationships

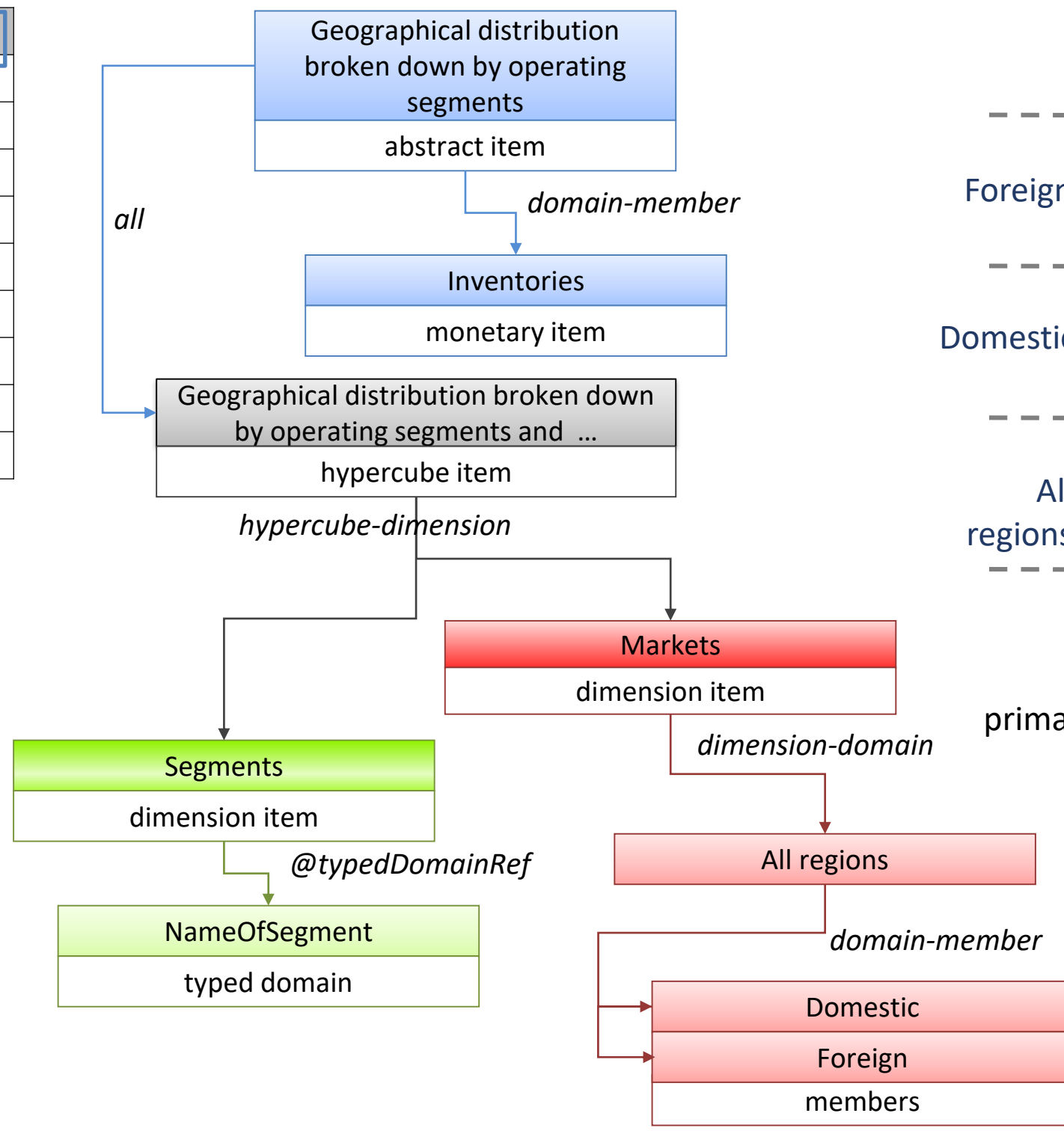
- domain-member:
  - defines hierarchical relations for primary items (note: lower-level elements inherit dimensional information declared for upper level elements in a tree structure)
  - defines hierarchical relations of domain members of each dimension
- all: connects a primary item to a hypercube implying use of dimensions (attached to this hypercube)
- notAll: connects a primary item to a hypercube prohibiting use of dimensions (attached to this hypercube)
- hypercubes-dimension: connects a hypercube and a dimension item
- dimension-domain: connects a dimension to its top level domain member
- dimension-default: connects a dimension to its default member (usually top level domain member being a total)



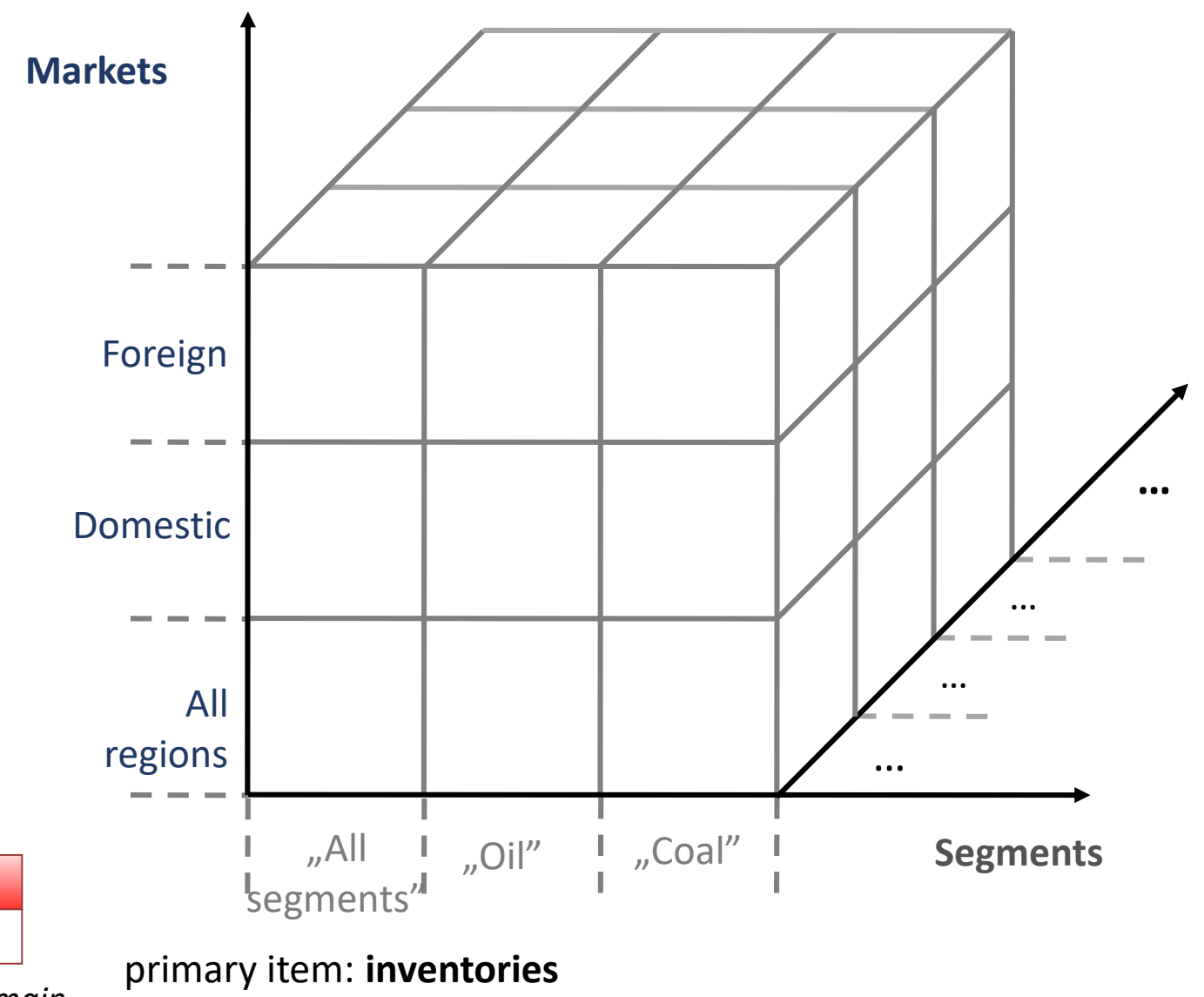
# How do the dimensional artefacts look on an example?

Geographical distribution broken down by operating segments

Markets	Segments	Inventories	...
All regions	All segments		
	Oil		
	Coal		
Domestic	All segments		
	Oil		
	Coal		
Foreign	All segments		
	Oil		
	Coal		

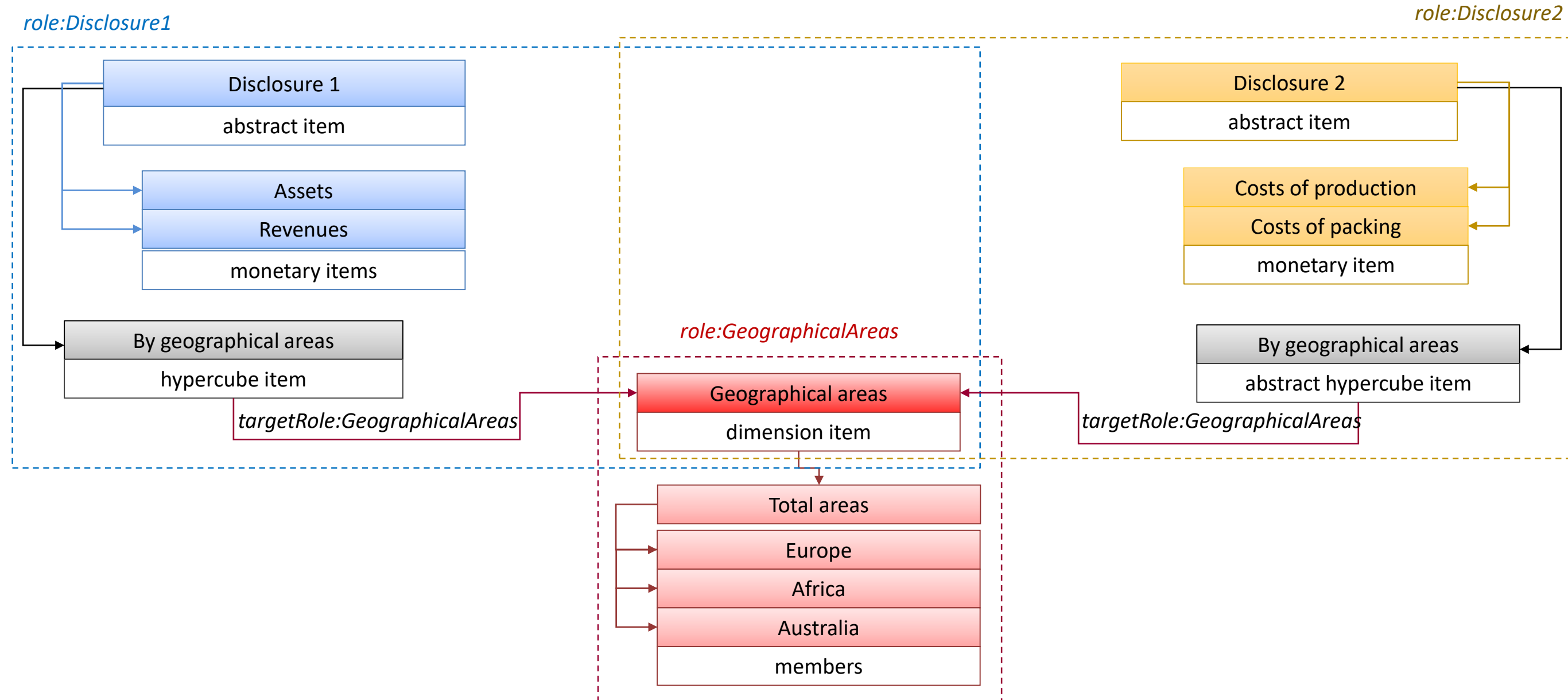


Geographical distribution broken down by operating segments and ...



# What is a *targetRole* attribute?

- may appear on any dimensional arc (apart from "dimension-default")
- indicates *extended link role* (set of relations) which defines the continuation of the relationship tree



- application:
  - reuse already (pre-)defined hierarchical structures (modularization and shrinking in size of taxonomies)
  - enable excluding domain members of particular dimensions (refers to impossibility of having different subelements in the same tree-set)
- allows to extend the scope of modularization (not only files and ELRs but also across ELRs!)
- important for measures when determining inheritance of dimensional information!

# What is a *usable* attribute?

- used to exclude undesired members from being used (reported) in contexts in instance documents but keeping them included in breakdowns' structures in order to help organize hierarchical relations

By counterparties (Dimension)			Loans and receivables			
			Unimpaired	Impaired, Gross	Allowances	Carrying amount
Financial Sector	Monetary	Central Banks				
	Financial	Other Monetary				
Non-Financial Sector						
Government	Federal Government					
	State Authorities					
	Social Security					

xbrldt:usable="false"

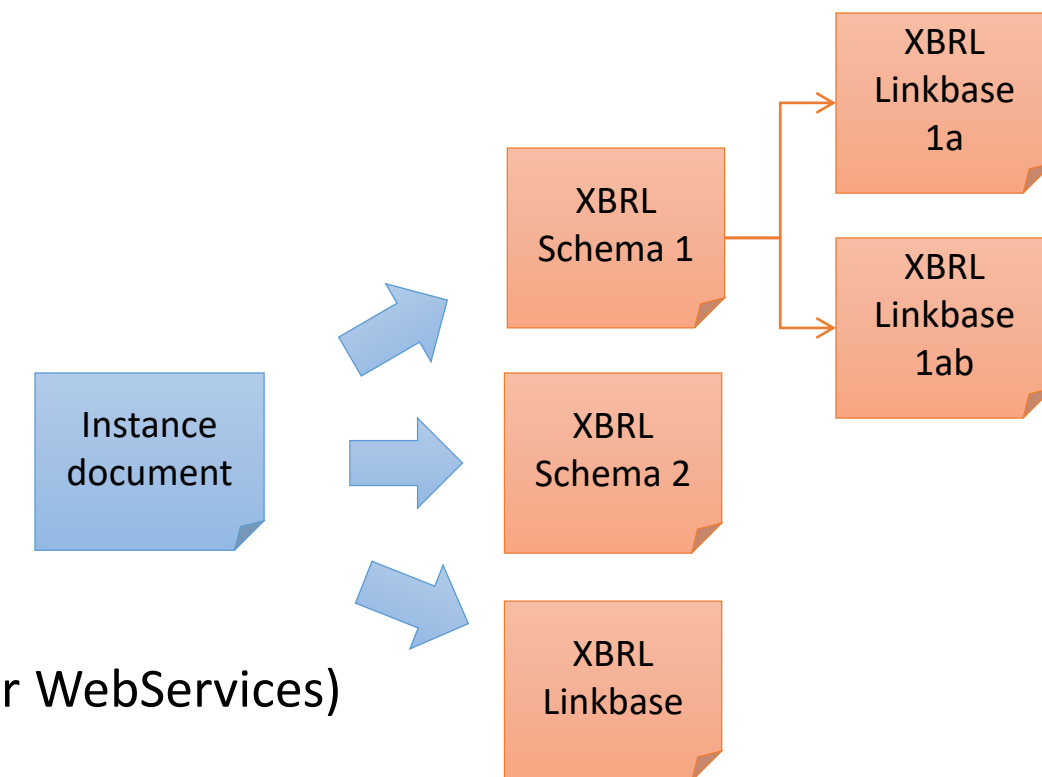
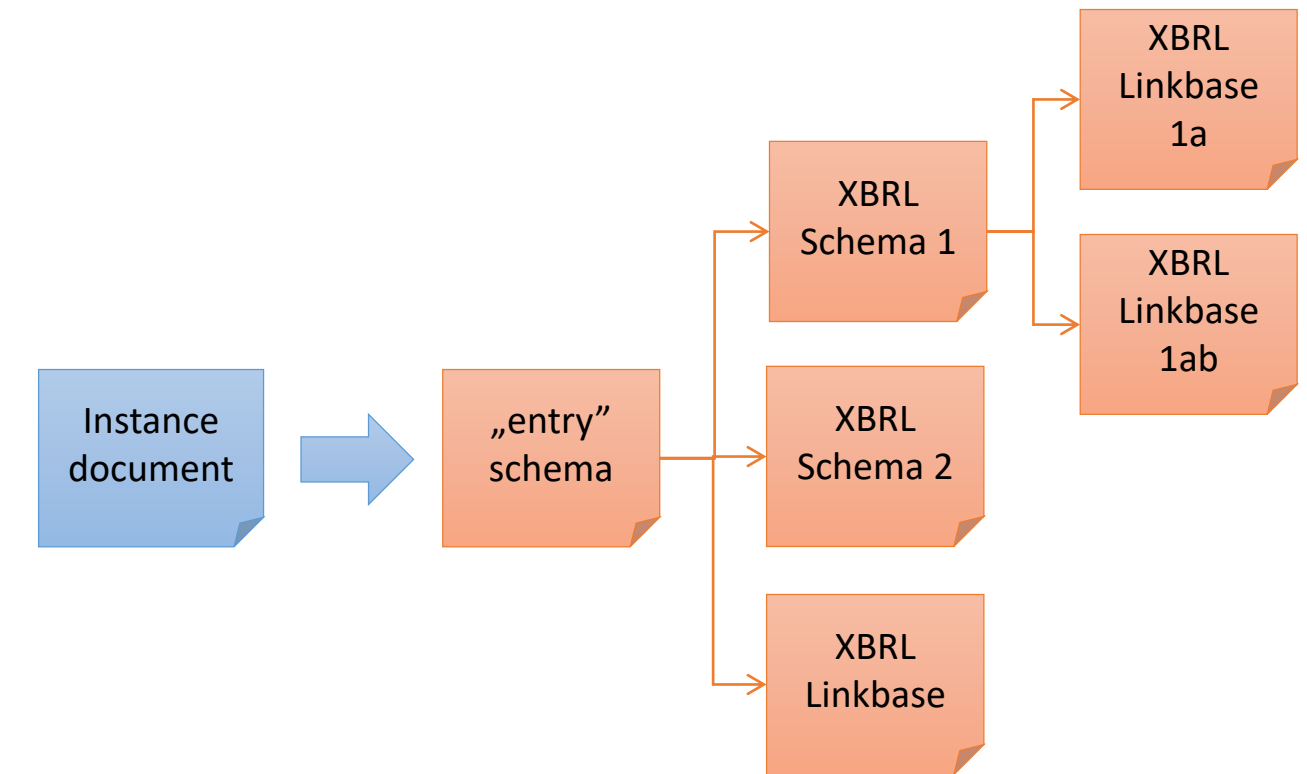
- similar to application of abstract items in presentation linkbase
- optional attribute on arcs with "dimension-domain" and "domain-member" arcroles
- boolean (default value: "true")

# XBRL instance document

# What is an XBRL Instance Document?

- XBRL instance document is a **business report in an electronic format** created according to the rules of XBRL specifications and the referenced taxonomies
- referencing XBRL taxonomy files from instance documents
  - depends on taxonomy modularisation (entry file or a set of files)
    - schemaRef
    - linkbaseRef
  - absolute/relative reference
  - declaration of namespace prefixes (preferably canonical)

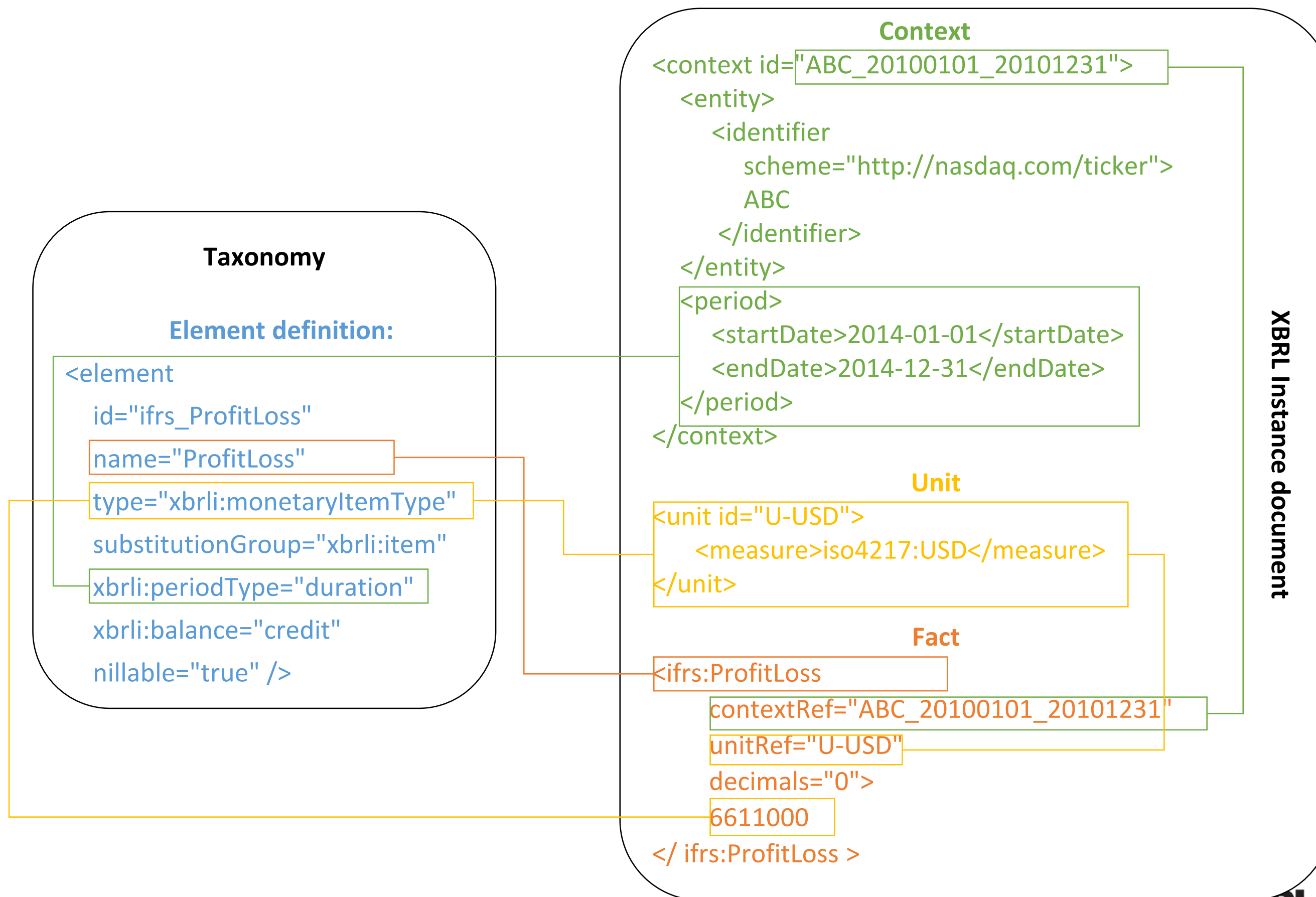
```
<?xml version="1.0" encoding="utf-8"?>
<xbrl xmlns="http://www.xbrl.org/2003/instance"
  xmlns:eba_met="http://www.eba.europa.eu/xbrl/crr/dict/met"
  xmlns:iso4217="http://www.xbrl.org/2003/iso4217"
  xmlns:link="http://www.xbrl.org/2003/linkbase"
  xmlns:xbrldi="http://xbrl.org/2006/xbrldi"
  xmlns:xlink="http://www.w3.org/1999/xlink">
<link:schemaRef
  xlink:href="http://www.eba.europa.eu/eu/fr/xbrl/crr/fws/finrep
/its-2013-03/2014-03-31/mod/finrep_con_gaap.xsd"
  xlink:type="simple"/>
(...)
</xbrl>
```



- XBRL instance may be embedded in another text file (e.g. XML document serving as an envelope for WebServices)



# What is the relation between concept declaration and a fact?



# How is reporting entity and period declared?

```
<xbrli:entity>
  <xbrli:identifier scheme="http://www.nasdaq.com/ticker">ACME</xbrli:identifier>
</xbrli:entity>
```

- scheme
  - URI
  - pattern basing on which identifiers are created (VAT Number, IBAN) or values from an enumerated list (e.g. ticker, ...)
- identifier: value from the set indicated by the scheme
- possibility to add validation rules in formula linkbase or processing application (but not in the taxonomy under XBRL 2.1 only)

```
<xbrli:period>
  <xbrli:startDate>2014-01-01</xbrli:startDate>
  <xbrli:endDate>2014-12-31</xbrli:endDate>
</xbrli:period>
```

```
<xbrli:period>
  <xbrli:instant>2014-12-31</xbrli:instant>
</xbrli:period>
```

```
<xbrli:period>
  <xbrli:forever/>
</xbrli:period>
```

distinction:

- for period
- as of
- always

*validation against concept definition as stated in the taxonomy*

type: dateTime (YYYY-MM-DDTHH:MM:SSZ) or date (YYYY-MM-DD)

validation: ending of 2014-12-31 (23:59:59+1s) = beginning of 2015-01-01 (00:00:00)

*end date 2014-12-31 = instant 2014-12-31 = start date 2015-01-01*

# How to declare a unit of measure?

```

<xbrli:unit id="EUR">
  <xbrli:measure>iso4217:EUR</xbrli:measure>
</xbrli:unit>

<xbrli:unit id="EarningsEURPerShare">
  <xbrli:divide>
    <xbrli:unitNumerator>
      <xbrli:measure>iso4217:EUR</xbrli:measure>
    </xbrli:unitNumerator>
    <xbrli:unitDenominator>
      <xbrli:measure>xbrli:shares</xbrli:measure>
    </xbrli:unitDenominator>
  </xbrli:divide>
</xbrli:unit>

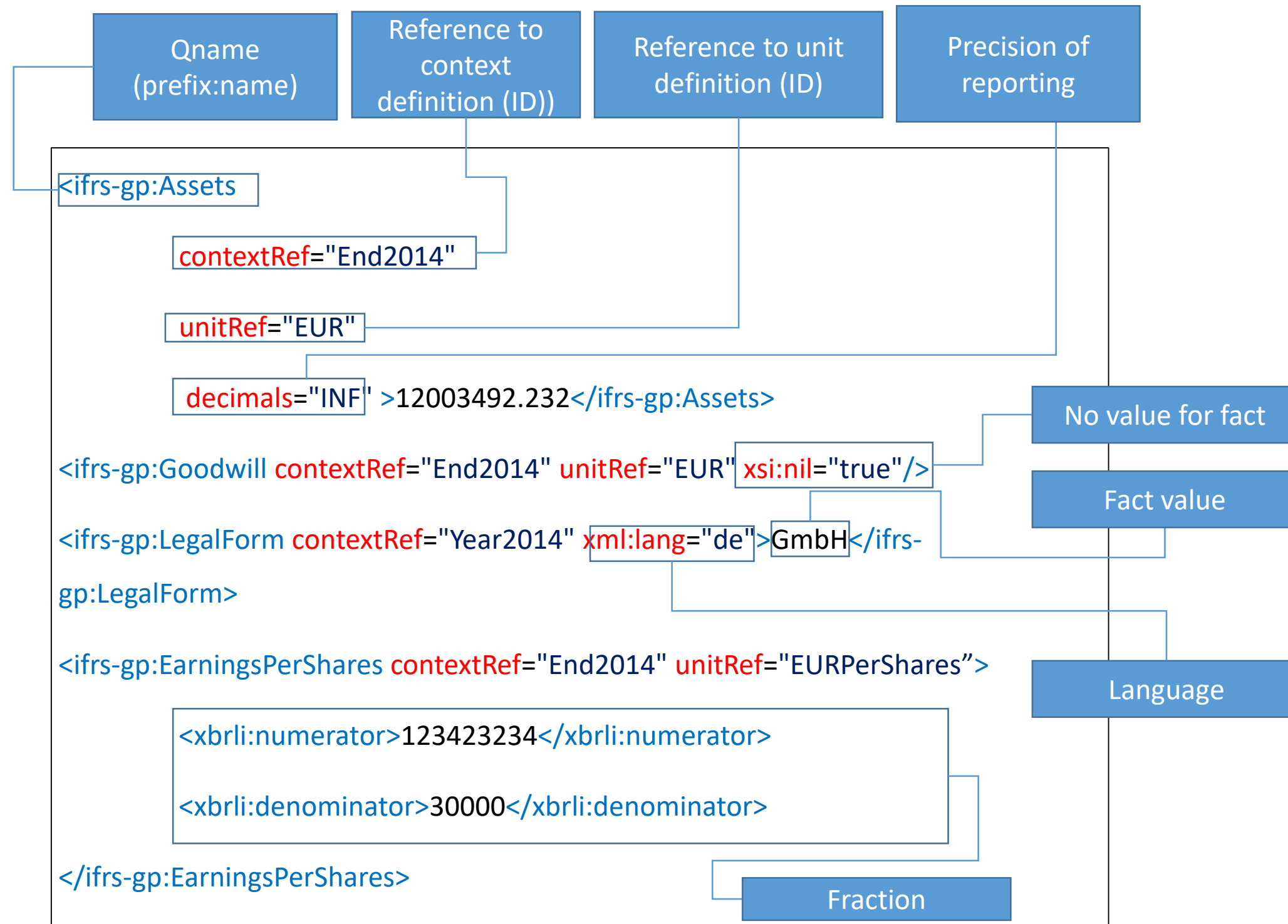
<xbrli:unit id="None">
  <xbrli:measure>xbrli:pure</xbrli:measure>
</xbrli:unit>

```

- applies to numeric concepts (validation)
- built-in validations:
  - currencies (iso4217:) – xbrli:monetaryItemType
  - shares (xbrli:shares) – xbrli:sharesItemType
  - none (xbrli:pure) – xbrli:pureItemType
- commonly defined:
  - % (e.g. 0-1 or 0-100)
  - employees (work hours, mandays)
  - EPS
- units registry
  - set of standard units that may appear in XBRL instance document
  - uses MathML definition tags to enable conversions between units
  - delivers concise and coherent approach to extend predefined set of units
  - <http://www.xbrl.org/utr/utr.xsd>

unitID	acre	sqft	MBoe	mile	hp	gal
unitName	Acre	Square Foot	Thousand Barrels of Oil Equivalent	mi	Horsepower	Gallon
itemType	arealtemType	arealtemType	energyItemType	lengthItemType	powerItemType	volumeltemType
...	...	...	...	...	...	...
symbol	a	ft <sup>2</sup>	MBoe	mi	hp	gal
definition	Acre	Square Foot	Thousand Barrels of Oil Equivalent	5280 Feet	Horsepower (Foot-pound per Second)	US Gallon
conversion Presentation	4046.86 * m <sup>2</sup>	0.09290304 * m <sup>2</sup>	6,117,863,200 * J	1609.344 * m	745.7 * W	0.003785412 * m <sup>3</sup>
conversion Content	4046.86 m <sup>2</sup>	0.09290304 m <sup>2</sup>	6,117,863,200 J	1609.344 m	745.7 W	0.003785412 m <sup>3</sup>
...	...	...	...	...	...	...

# How are facts declared in instance documents?



# What are the order things in an XBRL instance document?

- QName:

```
<xrli:xbml
  xmlns:ifrs="http://www.iasb.org/xbml/2010/ifrs"
  xmlns:us-gaap="http://www.fasb.org/xbml/2010/us-gaap"/>
<link:schemaRef xlink:type="simple" xlink:href="ifrs-2010.xsd"/>
<link:schemaRef xlink:type="simple" xlink:href="us-gaap-2010.xsd"/>

<ifrs:Assets ...>1000</ifrs:Assets>
<us-gaap:Assets ...>1010</us-gaap:Assets>
...
</xrli:xbml>
```

- Fact value

- appears between markups
- no value: xsi:nil="true" (if nillable="true")
- validation against concept data type: any characters (xrli:stringItemType), numeric (xrli:decimalItemType, xrli:monetaryItemType, xrli:nonNegativeIntegerItemType, ...), other custom (patterns, enumerated lists)

- Reference to context and unit declarations

- contextRef refers to id of a context declaration
- unitRef refers to id of a unit declaration
- id and its references: must not start with a digit or any of the illegal characters
- from XML/XBRL perspective: „unique whatever”

- allowed by XBRL but discouraged:

- duplicated facts (same or different value)
- duplicated context and units
- unused contexts or units
- unused but declared namespace prefixes

- streamlining

- <http://specifications.xbrl.org/spec-group-index-streaming-extensions.html>
- alignment of context, units and facts facilitating parsing
- <?xbrl-streamable-instance version="1.0" contextBuffer="1" unitBuffer="INF"?>

# What is segment and scenario?

```

<xbri:context id="c124314">
  <xbri:entity>
    <xbri:identifier scheme="http://www.nasdaq.com/ticker">ACME</xbri:identifier>
    <xbri:segment>
      <s:Region>Poland</s:Region>
    </xbri:segment>
  </xbri:entity>
  <xbri:scenario>
    <s:InformationOnData>
      <s:AuditStatus>Unaudited</s:AuditStatus>
      <s:TypeOfData>Forecasted</s:TypeOfData>
      <s:Comments/>
    </s:InformationOnData>
  </xbri:scenario>
  <xbri:period>
    <xbri:startDate>2007-01-01</xbri:startDate>
    <xbri:endDate>2007-12-31</xbri:endDate>
  </xbri:period>
</xbri:context>

```

Additional  
information  
about a fact  
referring to  
this context

```

<xsd:element name="Region" id="s_Region">
  <xsd:simpleType>
    <xsd:restriction base="xsd:token">
      <xsd:enumeration value="Europe"/>
      <xsd:enumeration value="Poland"/>
      <xsd:enumeration value="South America"/>
    </xsd:restriction>
  </xsd:simpleType>
</xsd:element>

```

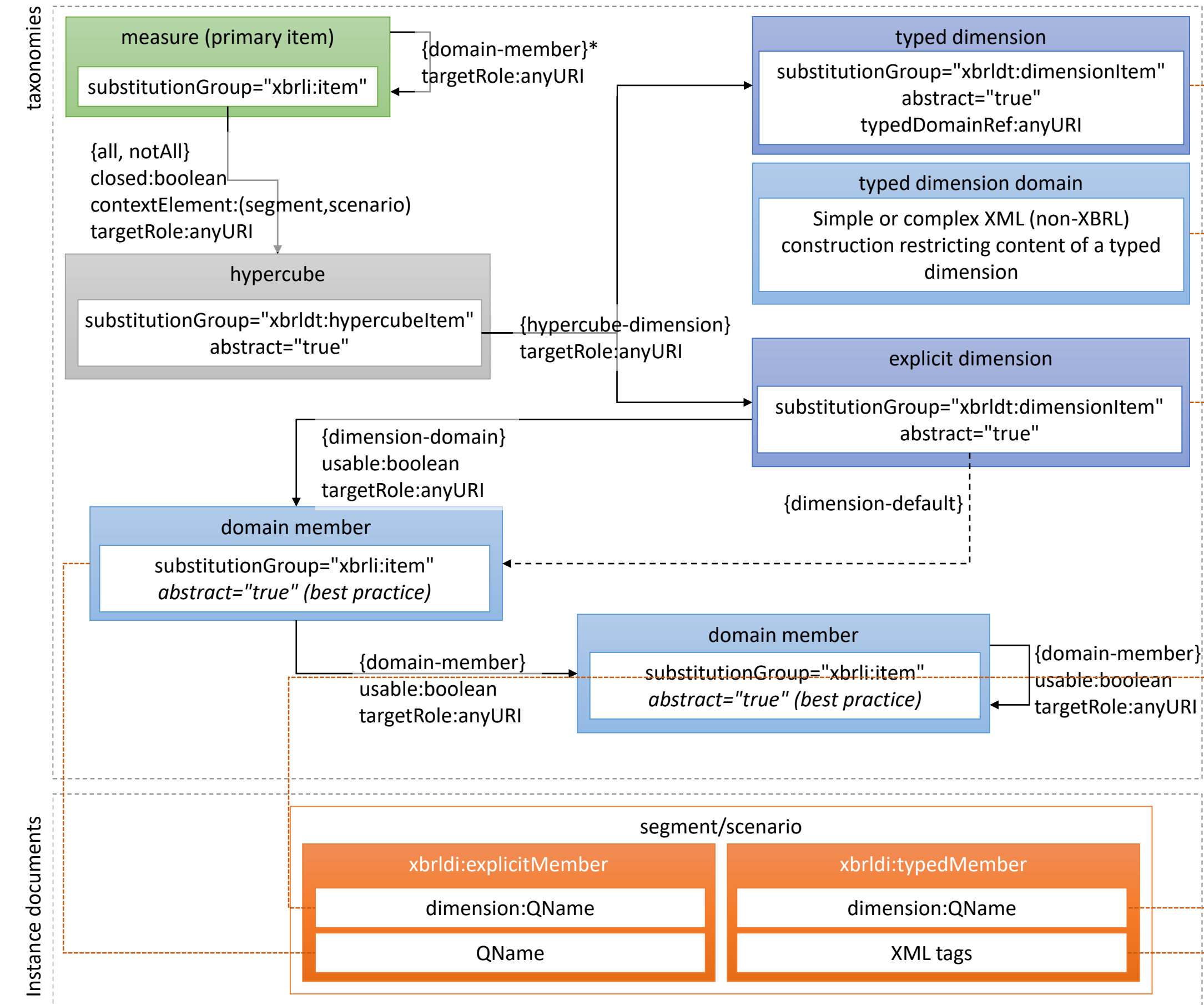
```

<xsd:element name="InformationOnData"
  id="s_InformationOnData">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element ref="s:AuditStatus"/>
      <xsd:element ref="s:Type"/>
      <xsd:element ref="s:Comments"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>

```

- segment
  - subelement of an entity information
  - contains additional information about a reporting party in case the entity identifier is insufficient (identification of a subsidiary related data in a report, by products/regions/clients breakdown of operations)
- scenario
  - subelement of a context
  - capturing additional information about a reported fact (actual/forecasted/budgeted, audited/unaudited, applied currency exchange rates)
- issue:
  - difficulty in indicating in taxonomies relations between items and assumed dimensional information
  - dimensional information is not constructed with XBRL functionality (i.e. relations, labels, references)

# How XBRL Dimensions impact the content of instance documents?



```

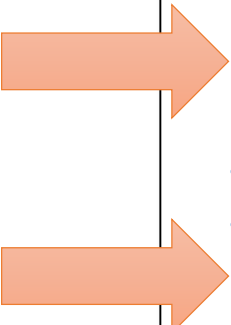
<xbrli:context id="c123I">
  <xbrli:entity>
    <xbrli:identifier
      scheme="http://www.stockexchange/ticker">
      ACME</xbrli:identifie>
    <xbrli:segment>
      <xbrldi:explicitMember
        dimension="d-g:GeographicalBreakdown">
        d-g:RegionsAll</xbrldi:explicitMember>
      <xbrldi:typedMember dimension="d-s:OperatingSegments">
        <d-s:Segment>Oil</d-s:Segment>
      </xbrldi:typedMember>
    </xbrli:segment>
  </xbrli:entity>
  <xbrli:period>
    <xbrli:startDate>2014-01-01</xbrli:startDate>
    <xbrli:endDate>2014-12-31</xbrli:endDate>
  </xbrli:period>
</xbrli:context>

<p:Revenues
  contextRef="c123I" (...) >120</p:Revenues>
  
```

# What is *contextElement* attribute?

- required attribute on arcs with "all" and "notAll" arcroles (connecting hypercube to primary item)
- possible values: "segment" or "scenario"
- indicates which of the instance document containers (xbrli:segment or xbrli:scenario) is chosen to contain dimensional information defined by a hypercube

```
<xbrli:context id="c...">
  <xbrli:entity>
    <xbrli:identifier scheme="http://www.stockexchange/ticker">ACME</xbrli:identifier>
    <xbrli:segment>
      <...>
    </xbrli:segment>
  </xbrli:entity>
  <xbrli:scenario>
    <...>
  </xbrli:scenario>
  <xbrli:period>
    <xbrli:startDate>2011-01-01</xbrli:startDate>
    <xbrli:endDate>2011-12-31</xbrli:endDate>
  </xbrli:period>
</xbrli:context>
```

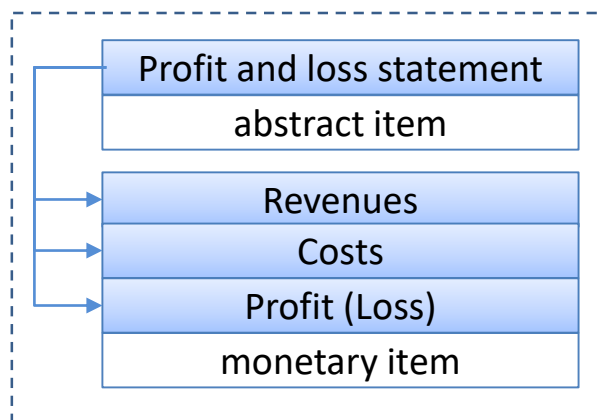


- consequences:
  - decision applied consistently with regard to a dimension
  - possibility to include two types of breakdowns at once
  - need to restrict unused container

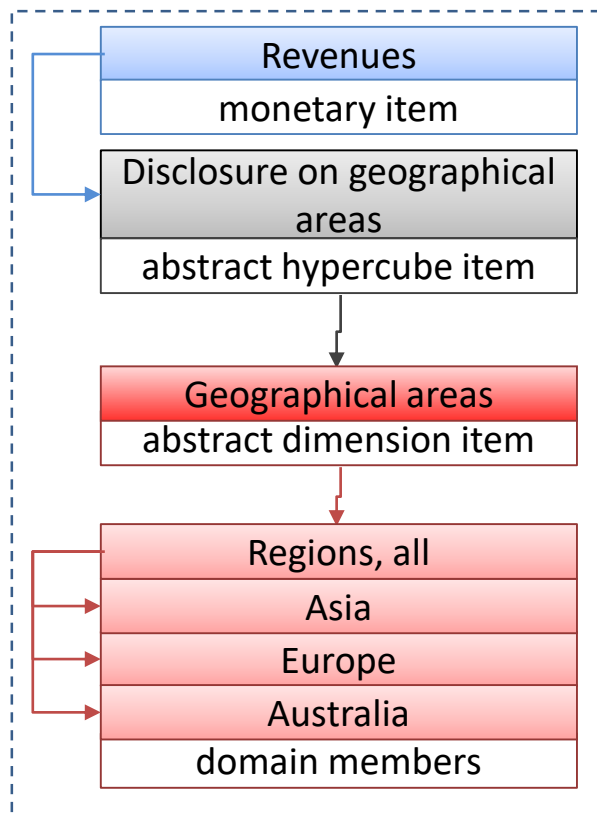


# How to avoid duplicated facts when applying dimensions?

role1: Profit and loss statement



role2: Disclosure on geographical areas



Profit and loss statement

Revenues	120
Costs	82
Profit (Loss)	38

Disclosure on geographical areas

	Revenues
Total	120
Asia	43
Europe	32
Australia	45

```

<xbrli:context id="Year2011">
  <xbrli:entity>
    <xbrli:identifier scheme="http://www.stockexchange/ticker">ACME</xbrli:identifier>
  </xbrli:entity>
  <xbrli:period>
    <xbrli:startDate>2011-01-01</xbrli:startDate>
    <xbrli:endDate>2011-12-31</xbrli:endDate>
  </xbrli:period>
</xbrli:context>

<xbrli:context id="Year2011_RegionsAll">
  <xbrli:entity>
    <xbrli:identifier scheme="http://www.stockexchange/ticker">ACME</xbrli:identifier>
    <xbrli:segment>
      <xbrldi:explicitMember dimension="d-g:GeographicalBreakdown">d-g:RegionsAll</xbrldi:explicitMember>
    </xbrli:segment>
  </xbrli:entity>
  <xbrli:period>
    <xbrli:startDate>2011-01-01</xbrli:startDate>
    <xbrli:endDate>2011-12-31</xbrli:endDate>
  </xbrli:period>
</xbrli:context>

<p:Revenues contextRef="Year2011" (...) >120</p:Revenues>
<p:Revenues contextRef="Year2011_RegionsAll" (...) >120</p:Revenues>

```

role1 allows reporting of Revenues with any dimensional information

Issues:

- same fact reported twice in different syntax
- it is impossible to report „Revenues” with no linking to dimensions since they are required by role2 and role3 (if a primary item is linked to any hypercube then it must satisfy requirements of any of these hypercubes)
- solution: default domain member and empty hypercube

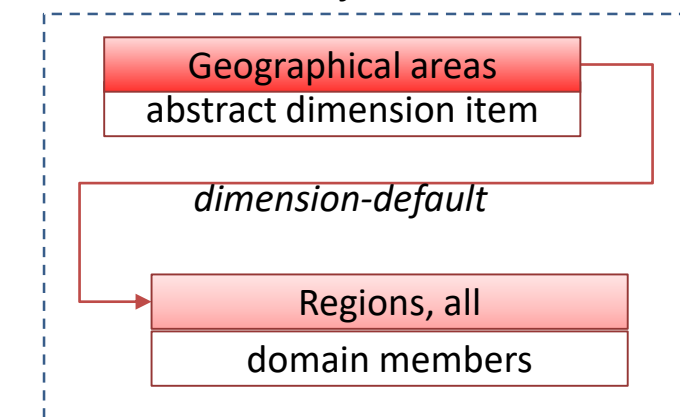
# What is dimension default member?

- dimensions may be assigned default domain members using "dimension-default" arcrole
- dimension default value is declared globally
- default dimension member:
  - aggregator (total) value of all enumerations of a breakdown (e.g. All regions, All products, ...)
  - artificial top level elements
  - assumed standard value (e.g. audited, consolidated, ...)
- default member MUST not appear in contexts in instance documents:

`<xbrldi:explicitMember dimension="d-g:GeographicalBreakdown">d-g:RegionsAll</xbrldi:explicitMember>`

however it is assumed that each context has this line

role: Dimension default members



*Profit and loss statement*

Revenues	120
Costs	82
Profit (Loss)	38

*Disclosure on geographical areas*

	Revenues
Total	120
Asia	43
Europe	32
Australia	45

```

<xbrli:context id="Year2011">
  <xbrli:entity>
    <xbrli:identifier scheme="http://www.stockexchange/ticker">ACME</xbrli:identifier>
    <xbrli:segment>
      <xbrldi:explicitMember dimension="d-g:GeographicalBreakdown">d-g:RegionsAll</xbrldi:explicitMember>
    </xbrli:segment>
  </xbrli:entity>
  <xbrli:period>
    <xbrli:startDate>2011-01-01</xbrli:startDate>
    <xbrli:endDate>2011-12-31</xbrli:endDate>
  </xbrli:period>
</xbrli:context>

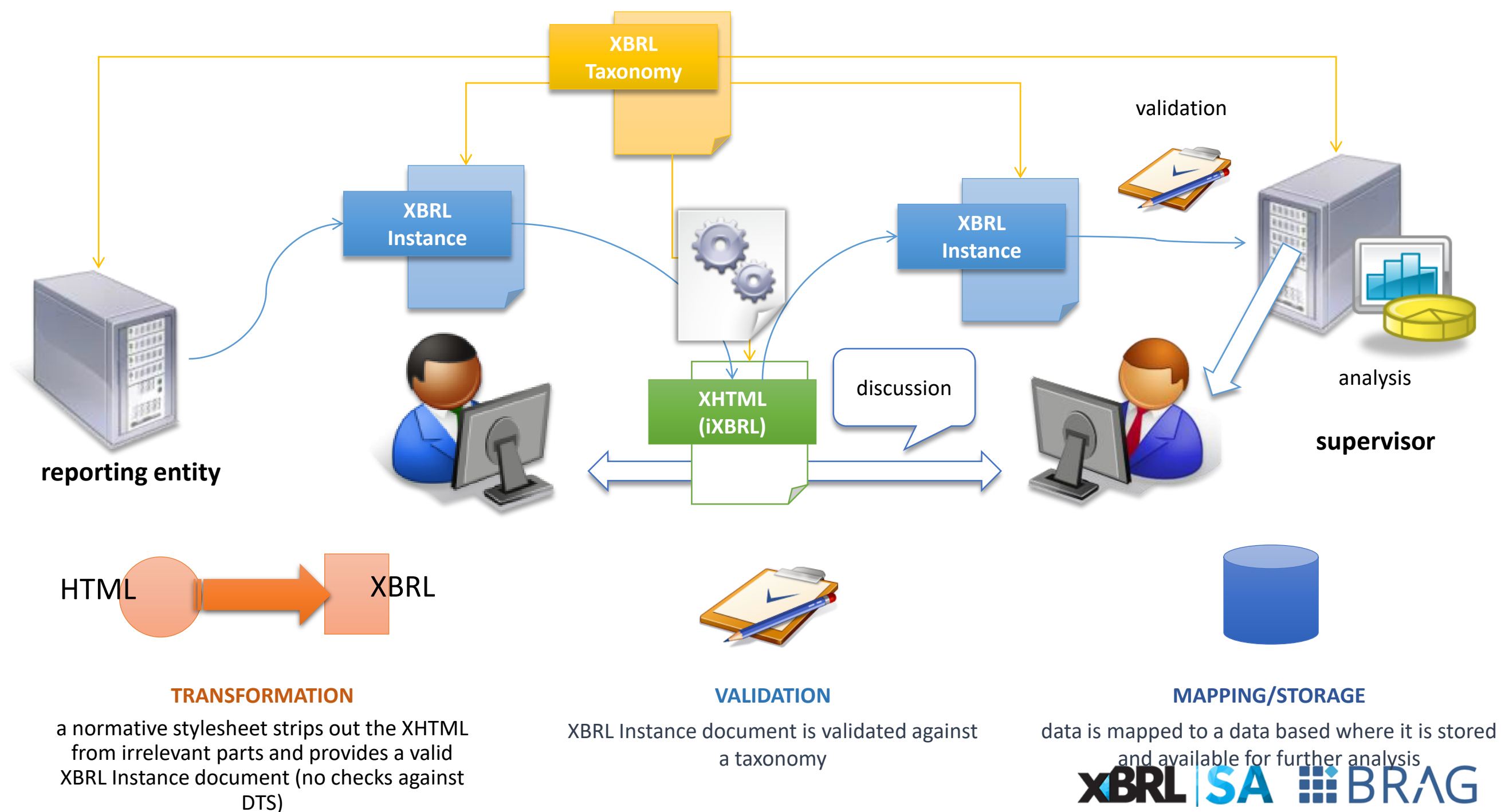
<p:Revenues contextRef="Year2011" (...) >120</p:Revenues>
  
```

# What is the idea behind inline XBRL?

- data + formatting
- various solutions: XSLT, dedicated, ...
- based on the idea of microformats:
  - „Designed for humans first and machines second, microformats are a set of simple, open data formats built upon existing and widely adopted standards”
- using existing standard: XBRL plus...
  - ...(X)HTML (new tags – elements and attributes)
    - extensible
    - well-formed XML (validated according to XHTML Schema - iX tags can be validated against iX schema)
    - use of namespaces
    - possibility to merge with other XML dialects
    - transformable with XSLT
  - ...PDF (to be developed next)
  - ...
- aim: machine readable data in a human readable format
- inline XBRL (iXBRL): a standard for embedding XBRL fragments into an (X)HTML document

## Primary use cases

- annual reports (layout matters for stressing some figures)
- comparative corporate information on a website (presentation + dynamic analysis)
- predefined forms (companies registrar, taxation)
- internal consolidation – reports (posted to intranet and Internet)



# What are the underlying specifications?

## Inline XBRL 1.1

🏠 [The XBRL Standard](#) / [XBRL Specifications](#) / [Inline XBRL](#) / [Inline XBRL 1.1](#)

**Specification documents:**

<a href="#">Part 1: Specification</a>	2013-11-18	Recommendation	HISTORY
<a href="#">Part 2: Schema</a>	2013-11-18	Recommendation	HISTORY

**Supporting documents:**

<a href="#">Conformance Suite</a>	2013-11-18	Conformance suite	HISTORY
<a href="#">Part 0: Primer</a>	2015-12-09	Overview document	HISTORY

### Elements:

- ix:continuation
- ix:header
- ix:references
- ix:denominator
- ix:hidden
- ix:relationship
- ix:exclude
- ix:nonFraction
- ix:resources
- ix:footnote
- ix:nonNumeric
- ix:tuple
- ix:fraction
- ix:numerator

### Attributes:

- arcrole
- fromRefs
- target
- contextRef
- id
- title
- continuationFrom
- linkRole
- toRefs
- decimals
- name
- tupleID
- escape
- precision
- tupleRef
- footnoteRole
- order
- unitRef
- format
- scale
- sign

<https://specifications.xbrl.org/work-product-index-inline-xbrl-inline-xbrl-1.1.html>

# How does inline XBRL looks in real life?

Ontex 2016

ontex-20161231.xhtml

## 1.4. Legal status

Ontex Group NV is a limited-liability company incorporated as a "naamloze vennootschap" ("NV") under Belgian law with company registration number 0550.880.915. Ontex Group NV has its registered office at Korte Keppestraat 21, 9320 Erembodegem (Aalst) Belgium. The shares of Ontex Group NV are listed on the regulated market of Euronext Brussels.

## 2. CONSOLIDATED STATEMENT OF FINANCIAL POSITION AS AT DECEMBER 31

ASSETS in € million	Note	December 31, 2016	December 31, 2015
<b>Non-current Assets</b>			
Goodwill	8	1,096.2	860.1
Intangible assets	8	32.5	4.5
Property, plant and equipment	9	455.5	319.0
Deferred tax assets	17	8.7	7.0
Non-current receivables		0.3	-
		<b>1,593.2</b>	<b>1,190.6</b>
<b>Current Assets</b>			
Inventories	11	254.2	201.1
Trade receivables	10	312.5	218.1
Prepaid expenses and other receivables	10	61.0	49.0
Current income tax	17	10.6	7.3
Derivative financial assets	4.1	4.7	2.2
Cash and cash equivalents	12	212.8	236.8
		<b>855.8</b>	<b>714.5</b>
<b>TOTAL ASSETS</b>		<b>2,449.0</b>	<b>1,905.1</b>
<b>EQUITY AND LIABILITIES in € million</b>			
<b>Equity attributable to owners of the company</b>			
Share capital & Premium	13	988.8	913.1
Cumulative translation differences		(42.5)	(24.3)
Treasury shares		(22.3)	(13.1)
Retained earnings and other reserves		75.1	(23.5)
<b>TOTAL EQUITY</b>		<b>999.1</b>	<b>852.2</b>
<b>Non-current liabilities</b>			
Employee benefit liabilities	16	22.6	19.7
Provisions	19	0.3	0.2

**Inline XBRL**

Highlight all tags

**Line item**  
ifrs-full:Goodwill

**Value**  
€ 1,096,200,000.00

**Period**  
2016-12-31

**Units**  
iso4217:EUR

**Entity**  
[549300AQESC6JJOPW253](#)

```

<td style="width: 119.4pt; padding-right: 5.4pt; padding-left: 5.4pt; vertical-align: middle; background-color: #ffffff;"> == $0
<p style="margin: 0pt; text-align: right;">
  <span style="font-family: Calibri; font-size: 9pt;">
    <span class="ixbrl-element ixbrl-element-nonfraction ixbrl-highlight">
      <ix:nonfraction contextref="I20161231" name="ifrs-full:Goodwill" unitref="EUR" id="Tag90" decimals="-5" scale="6" format="ixt:numdotdecimal">1,096.2</ix:nonfraction>
    </span>
  </span>
</p>
</td>

```

# What is non-fraction element?

```

<td colspan="2" style=
"vertical-align:bottom;background-color:#cceeff;padding-left:2px;padding-top:2px;padding-
bottom:2px;">
  <div style="text-align:right;font-size:10pt;">
    <span style="font-family:inherit;font-size:10pt;font-weight:bold;">
      <span>
        <ix:nonFraction id=
"d74595769e1308-wk-Fact-D86FEC7FD138B2A7B3447A4BBDDF9B2E" name=
"us-gaap:Assets" contextRef=
"FI2016Q4_us-gaap_StatementBusinessSegmentsAxis_len_LennarHomebuildingEas
tCentralWestHoustonandOtherMember" unitRef="usd" decimals="-3" scale="3"
format="ixt:numdotdecimal">11,804,768</ix:nonFraction>
      </span>
    </span>
  </div>
</td>
<td style=
"vertical-align:bottom;background-color:#cceeff;padding-left:2px;padding-top:2px;padding-
bottom:2px;">
  <div style="text-align:right;font-size:10pt;">
    <span style="font-family:inherit;font-size:10pt;">
      <span>
        <ix:nonFraction id=
"d74595769e1327-wk-Fact-00C5D3E7C2C5F42A23527A4BBDE0E8D7" name=
"us-gaap:Assets" contextRef=
"FI2015Q4_us-gaap_StatementBusinessSegmentsAxis_len_LennarHomebuildingEas
tCentralWestHoustonandOtherMember" unitRef="usd" decimals="-3" scale="3"
format="ixt:numdotdecimal">11,072,820</ix:nonFraction>
      </span>
    </span>
  </div>
</td>

```

## LENNAR CORPORATION AND SUBSIDIARIES

### CONSOLIDATED BALANCE SHEETS

November 30, 2016 and 2015

	2016 (1)	2015 (1)
	(Dollars in thousands, except shares and per share amounts)	
<b>ASSETS</b>		
<b>Lennar Homebuilding:</b>		
Cash and cash equivalents	\$ 1,050,138	893,408
Restricted cash	5,977	13,505
Receivables, net	106,976	74,538
Inventories:		
Finished homes and construction in progress	3,951,716	3,957,167
Land and land under development	5,106,191	4,724,578
Consolidated inventory not owned	121,019	58,851
Total inventories	9,178,926	8,740,596
Investments in unconsolidated entities	811,723	741,551
Other assets	651,028	609,222
	<u>11,804,768</u>	<u>11,072,820</u>
<b>Rialto</b>	1,276,210	1,505,500
<b>Lennar Financial Services</b>	1,754,672	1,425,837
<b>Lennar Multifamily</b>	526,131	415,352
<b>Total assets</b>	<u>\$ 15,361,781</u>	<u>14,419,509</u>

(1) Under certain provisions of Accounting Standards Codification ("ASC") Topic 810, Consolidations, ("ASC 810") the Company is required to separately disclose on its consolidated balance sheets the assets of consolidated variable interest entities ("VIEs") that are owned by the consolidated VIEs and liabilities of consolidated VIEs as to which there is no recourse against the Company.

As of November 30, 2016, total assets include \$536.3 million related to consolidated VIEs of which \$13.3 million is included in Lennar Homebuilding cash and cash equivalents, \$0.2 million in Lennar Homebuilding receivables, net, \$54.2 million in Lennar Homebuilding finished homes and construction in progress, \$106.3 million in Lennar Homebuilding land and land under development, \$121.0 million in Lennar Homebuilding consolidated inventory not owned, \$4.6 million in Lennar Homebuilding investments in unconsolidated entities, \$13.9 million in Lennar Homebuilding other assets, \$213.8 million in Rialto assets and \$8.8 million in Lennar Multifamily assets.

# What is nonnumeric element?

**LENNAR CORPORATION AND SUBSIDIARIES**  
**NOTES TO CONSOLIDATED FINANCIAL STATEMENTS**

**1. Summary of Significant Accounting Policies**

Basis of Consolidation

The accompanying consolidated financial statements include the accounts of Lennar Corporation and all subsidiaries, partnerships and other entities in which Lennar Corporation has a controlling interest and VIEs (see Note 15) in which Lennar Corporation is deemed the primary beneficiary (the "Company"). The Company's investments in both unconsolidated entities in which a significant, but less than controlling, interest is held and in VIEs in which the Company is not deemed to be the primary beneficiary are accounted for by the equity method. All intercompany transactions and balances have been eliminated in consolidation.

Use of Estimates

The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America ("GAAP") requires management to make estimates and assumptions that affect the amounts reported in the consolidated financial statements and accompanying notes. Actual results could differ from those estimates.

Revenue Recognition

Revenues from sales of homes to homeowners are recognized when the homeowner's initial and continuing involvement with the new home is complete. The earnings process is complete when the homeowner's initial and continuing involvement with the new home is complete.

Attributes	
Consolidation, Policy [Policy Text Block]	
Tag	us-gaap:ConsolidationPolicyTextBlock
Fact	The accompanying consolidated financial statements include the accounts of Lennar Corporation and all subsidiaries, partnerships and other entities in which Lennar Corporation has a controlling interest and VIEs (see Note 15) in which Lennar Corporation is...
Period	12 months ending 11/30/2016
Type	textBlockItemType

```
<div style="line-height:120%;font-size:10pt;">
  <span style="font-family:inherit;font-size:10pt;font-weight:bold;">1.
  <ix:nonNumeric contextRef="FD2016Q4YTD" name=
  "us-gaap:SignificantAccountingPoliciesTextBlock" id=
  "TextSelection-CE2CA92EBB3706A2278A7A4BBDE345ED-0-wk-Fact-CE7C7EBF0856412B1A827A4
  BBD9C1644" continuedAt="TextSelection-CE2CA92EBB3706A2278A7A4BBDE345ED-1" escape
  ="true">Summary of Significant Accounting Policies</ix:nonNumeric></span>
</div>
<ix:continuation id="TextSelection-CE2CA92EBB3706A2278A7A4BBDE345ED-1" continuedAt=
"TextSelection-CE2CA92EBB3706A2278A7A4BBDE345ED-2">
  <div style="line-height:120%;padding-top:12px;font-size:10pt;">
    <span style="font-family:Arial;font-size:10pt;">Basis of Consolidation</span>
  </div>
  <div style="line-height:120%;padding-top:8px;text-indent:48px;font-size:10pt;">
    <span style="font-family:inherit;font-size:10pt;">
      <ix:nonNumeric contextRef="FD2016Q4YTD" name=
      "us-gaap:ConsolidationPolicyTextBlock" id=
      "TextSelection-4E004885B3C0DF6086427A4BBDE34153-0-wk-Fact-BF2DF8E80FFC96B
      961537A4BBDA61861" escape="true">The accompanying consolidated
      financial statements include the accounts of Lennar Corporation and all
      subsidiaries, partnerships and other entities in which Lennar
      Corporation has a controlling interest and VIEs (see Note 15) in which
      Lennar Corporation is deemed the primary beneficiary (the "Company").
      The Company's investments in both unconsolidated entities in
      which a significant, but less than controlling, interest is held and in
      VIEs in which the Company is not deemed to be the primary beneficiary
      are accounted for by the equity method. All intercompany transactions
      and balances have been eliminated in consolidation.</ix:nonNumeric>
    </span>
  </div>
</div>
```

homeowner, the new  
the home, the new  
substantial continuing  
own payment is received,  
ed. See Lennar Financial  
policies related to these

# What is the header, hidden and resources?

```

<ix:header>
<ix:hidden>
<ix:nonNumeric contextRef="FD2016Q4YTD" name="dei:CurrentFiscalYearEndDate" id=
"Fact-4B790EBD94E5ABB15E957A4BBDB06E9F-wk-Fact-4B790EBD94E5ABB15E957A4BBDB06E9F"--11-30</ix:nonNumeric>
<ix:nonNumeric contextRef="FD2016Q4YTD" name="dei:DocumentFiscalPeriodFocus" id=
"Fact-2FA767924FC2B2923A147A4BBDD09510-wk-Fact-2FA767924FC2B2923A147A4BBDD09510">FY</ix:nonNumeric>
<ix:nonNumeric contextRef="FD2016Q4YTD" name="dei:DocumentFiscalYearFocus" id=
"Fact-60CDE763CDDDF128CA7A4BBDBB65CA-wk-Fact-60CDE763CDDDF128CA7A4BBDBB65CA">2016</ix:nonNumeric>
<ix:nonNumeric contextRef="FD2016Q4YTD" name="dei:DocumentType" id=
"Fact-BE971E5433E24795E9A17A4BBDCDDF77-wk-Fact-BE971E5433E24795E9A17A4BBDCDDF77">10-K</ix:nonNumeric>
<ix:nonNumeric contextRef="FD2016Q4YTD" name="dei:EntityCentralIndexKey" id=
"Fact-C037FC38C46AA49406157A4BBDE1F548-wk-Fact-C037FC38C46AA49406157A4BBDE1F548">000920760</ix:nonNumeric>
<ix:nonNumeric contextRef="FD2016Q4YTD" name="dei:EntityCurrentReportingStatus" id=
"Fact-DB3310E9E9BDDFAB65A57A4BBDA61284-wk-Fact-DB3310E9E9BDDFAB65A57A4BBDA61284">Yes</ix:nonNumeric>
<ix:nonNumeric contextRef="FD2016Q4YTD" name="dei:EntityRegistrantName" id=
"Fact-008DE72AF358E3A271BF7A4BBDA685C7-wk-Fact-008DE72AF358E3A271BF7A4BBDA685C7">LENNAR CORP /NEW</ix:nonNumeric>
<ix:nonNumeric contextRef="FD2016Q4YTD" name="dei:EntityVoluntaryFilers" id=
"Fact-01388637478954B161557A4BBDB0B591-wk-Fact-01388637478954B161557A4BBDB0B591">No</ix:nonNumeric>
<ix:nonNumeric contextRef="FD2016Q4YTD" name="dei:EntityWellKnownSeasonedIssuer" id=
"Fact-AD822188DD3B9B7304A37A4BBDE17C5C-wk-Fact-AD822188DD3B9B7304A37A4BBDE17C5C">Yes</ix:nonNumeric>
<...>
</ix:hidden>
<ix:references>
<link:schemaRef xlink:href="len-20161130.xsd" xlink:type="simple"/>
</ix:references>
<ix:resources>
<ixbrli:context id="FD2016Q4YTD">
<ixbrli:entity>
<ixbrli:identifier scheme="http://www.sec.gov/CIK">0000920760</ixbrli:identifier>
</ixbrli:entity>
<ixbrli:period>
<ixbrli:startDate>2015-12-01</ixbrli:startDate>
<ixbrli:endDate>2016-11-30</ixbrli:endDate>
</ixbrli:period>
</ixbrli:context>
<...>
</ix:resources>
</ix:header>

```

UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION  
Washington, D.C. 20549

**FORM 10-K**

ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF  
THE SECURITIES EXCHANGE ACT OF 1934

For the fiscal year ended November 30, 2016

Commission file number 1-11749

**LENNAR**

**Lennar Corporation**

(Exact name of registrant as specified in its charter)

Delaware  
(State or other jurisdiction of  
incorporation or organization)

95-4337490  
(I.R.S. Employer  
Identification No.)

700 Northwest 107th Avenue, Miami, Florida 33172  
(Address of principal executive offices) (Zip Code)

Registrant's telephone number, including area code (305) 559-4000

Securities registered pursuant to Section 12(b) of the Act:

Title of each class  
Class A Common Stock, par value 10¢  
Class B Common Stock, par value 10¢

Name of each exchange on which registered  
New York Stock Exchange  
New York Stock Exchange

Securities registered pursuant to Section 12(g) of the Act:

NONE



# What is footnote element?

```

<td style="vertical-align:top;">
  <div style="line-height:120%;text-align:left;font-size:9pt;">
    <span style="font-family:inherit;font-size:9pt;">
      <ix:footnote id=
        "TextSelection-93C33F7BAC0D68C84FC87A4BBDE36A9B-0-wk-Footer-93C33F7BA
        COD68C84FC87A4BBDE36A9B_lbl" footnoteRole=
        "http://www.xbrl.org/2003/role/footnote" xml:lang="en-US" continuedAt=
        "TextSelection-93C33F7BAC0D68C84FC87A4BBDE36A9B-1">Under certain
        provisions of Accounting Standards Codification ("ASC") Topic 810,
        Consolidations, ("ASC 810") the Company is required to separately
        disclose on its consolidated balance sheets the assets of
        consolidated variable interest entities ("VIEs") that are owned by
        the consolidated VIEs and liabilities of consolidated VIEs as to
        which there is no recourse against the Company.</ix:footnote>
      </span>
    </div>
  </td>
</tr>
</table>
<ix:continuation id="TextSelection-93C33F7BAC0D68C84FC87A4BBDE36A9B-1" continuedAt=
  "TextSelection-93C33F7BAC0D68C84FC87A4BBDE36A9B-2">
  <div style="line-height:120%;padding-top:8px;padding-left:24px;font-size:9pt;">
    <span style="font-family:inherit;font-size:9pt;">As of </span>
    <span style=
      "font-family:inherit;font-size:9pt;color:#000000;text-decoration:none;">November
      &#160;30, 2016</span>
    ...
  </div>
</ix:continuation>

```

## LENNAR CORPORATION AND SUBSIDIARIES

### CONSOLIDATED BALANCE SHEETS

November 30, 2016 and 2015

	2016 (1)	2015 (1)
	(Dollars in thousands, except shares and per share amounts)	
<b>ASSETS</b>		
<b>Lennar Homebuilding:</b>		
Cash and cash equivalents	\$ 1,050,138	893,408
Restricted cash	5,977	13,505
Receivables, net	106,976	74,538
Inventories:		
Finished homes and construction in progress	3,951,716	3,957,167
Land and land under development	5,106,191	4,724,578
Consolidated inventory not owned	121,019	58,851
Total inventories	9,178,926	8,740,596
Investments in unconsolidated entities	811,723	741,551
Other assets	651,028	609,222
	<u>11,804,768</u>	<u>11,072,820</u>
<b>Rialto</b>	1,276,210	1,505,500
<b>Lennar Financial Services</b>	1,754,672	1,425,837
<b>Lennar Multifamily</b>	526,131	415,352
<b>Total assets</b>	<u>\$ 15,361,781</u>	<u>14,419,509</u>

(1) Under certain provisions of Accounting Standards Codification ("ASC") Topic 810, Consolidations, ("ASC 810") the Company is required to separately disclose on its consolidated balance sheets the assets of consolidated variable interest entities ("VIEs") that are owned by the consolidated VIEs and liabilities of consolidated VIEs as to which there is no recourse against the Company.

As of November 30, 2016, total assets include \$536.3 million related to consolidated VIEs of which \$13.3 million is included in Lennar Homebuilding cash and cash equivalents, \$0.2 million in Lennar Homebuilding receivables, net, \$54.2 million in Lennar Homebuilding finished homes and construction in progress, \$106.3 million in Lennar Homebuilding land and land under development, \$121.0 million in Lennar Homebuilding consolidated inventory not owned, \$4.6 million in Lennar Homebuilding investments in unconsolidated entities, \$13.9 million in Lennar Homebuilding other assets, \$213.8 million in Rialto assets and \$8.8 million in Lennar Multifamily assets.

```

<ix:relationship arcrole="http://www.xbrl.org/2003/arcrole/fact-footnote"
  linkRole="http://www.xbrl.org/2003/role/link" order="1" fromRefs=
  "d74595769e1327-wk-Fact-00C5D3E7C2C5F42A23527A4BBDE0E8D7"
  toRefs="d74704401e4071-wk-Fact-00C5D3E7C2C5F42A23527A4BBDE0E8D7">
  <TextSelection-93C33F7BAC0D68C84FC87A4BBDE36A9B-0-wk-Footer-93C33F7BAC0D
  68C84FC87A4BBDE36A9B_lbl"/>
</ix:relationship>
<ix:relationship arcrole="http://www.xbrl.org/2003/arcrole/fact-footnote"
  linkRole="http://www.xbrl.org/2003/role/link" order="1" fromRefs=
  "d74595769e1156-wk-Fact-0C80EE759EE9A02DD3BE7A4BBDDF40F3"
  toRefs="TextSelection-C899402817E411B6E03E7A4BBDE3ED54-0-wk-Footer-C899402817E4
  11B6E03E7A4BBDE3ED54_lbl"/>
</ix:relationship>
<ix:relationship arcrole="http://www.xbrl.org/2003/arcrole/fact-footnote"
  linkRole="http://www.xbrl.org/2003/role/link" order="1" fromRefs=
  "d74595769e1240-wk-Fact-0F0FBDD68851B764983C7A4BBDDFEDDB
  d74632348e1775-wk-Fact-0F0FBDD68851B764983C7A4BBDDFEDDB
  d74660335e918-wk-Fact-0F0FBDD68851B764983C7A4BBDDFEDDB
  d74704401e1372-wk-Fact-0F0FBDD68851B764983C7A4BBDDFEDDB"
  toRefs="TextSelection-93C33F7BAC0D68C84FC87A4BBDE36A9B-0-wk-Footer-93C33F7BAC0D
  68C84FC87A4BBDE36A9B_lbl"/>

```

# Where to find more examples?

<https://www.ifrs.org/issued-standards/ifrs-taxonomy/ifrs-taxonomy-illustrative-examples/#illustrative2018>

## Example 1: Illustrative financial statements for SMEs (Small and Medium-sized Entities)

This example represents a full set of illustrative financial statements for SMEs which have been tagged using XBRL. The notes have been tagged using both block tagging and detailed tagging.

Format	Link
Inline XBRL	ixbri_example1_2017-03-09.xhtml
ZIP (XBRL and Inline XBRL)	example1_2017-03-09.zip

## Example 2: Statements of Financial Position, Comprehensive Income, and Changes in Equity

This example represents how the requirements in IAS 1 (IG6) to present the Statements of Financial position, Comprehensive Income, and Changes in Equity might be met using detailed XBRL tagging with the use of XBRL footnotes.

Format	Link
Inline XBRL	ixbri_example2_2017-03-09.xhtml
ZIP (XBRL and Inline XBRL)	example2_2017-03-09.zip

## Example 3: Statement of Cash Flows

These examples represent how the requirements of IAS 7 to present the Statement of Cash Flows and segment information for cash flows might be met using detailed XBRL tagging.

Format	Link
Inline XBRL	ixbri_example3_2017-03-09.xhtml
ZIP (XBRL and Inline XBRL)	example3_2017-03-09.zip

## Example 4: Financial Instruments

These examples represent how some of the disclosures required by IFRS 7 for financial instruments (in IG14) might be tagged using both block tagging and detailed tagging.

Format	Link
Inline XBRL	ixbri_example4_2017-03-09.xhtml
ZIP (XBRL and Inline XBRL)	example4_2017-03-09.zip

## Example 5: Operating segments

These examples represent how some of the disclosures required by IFRS 8 for operating segments (in IG2, IG3, IG4, IG5 and IG6) might be tagged using both block tagging and detailed tagging.

Format	Link
Inline XBRL	ixbri_example5_2017-03-09.xhtml
ZIP (XBRL and Inline XBRL)	example5_2017-03-09.zip

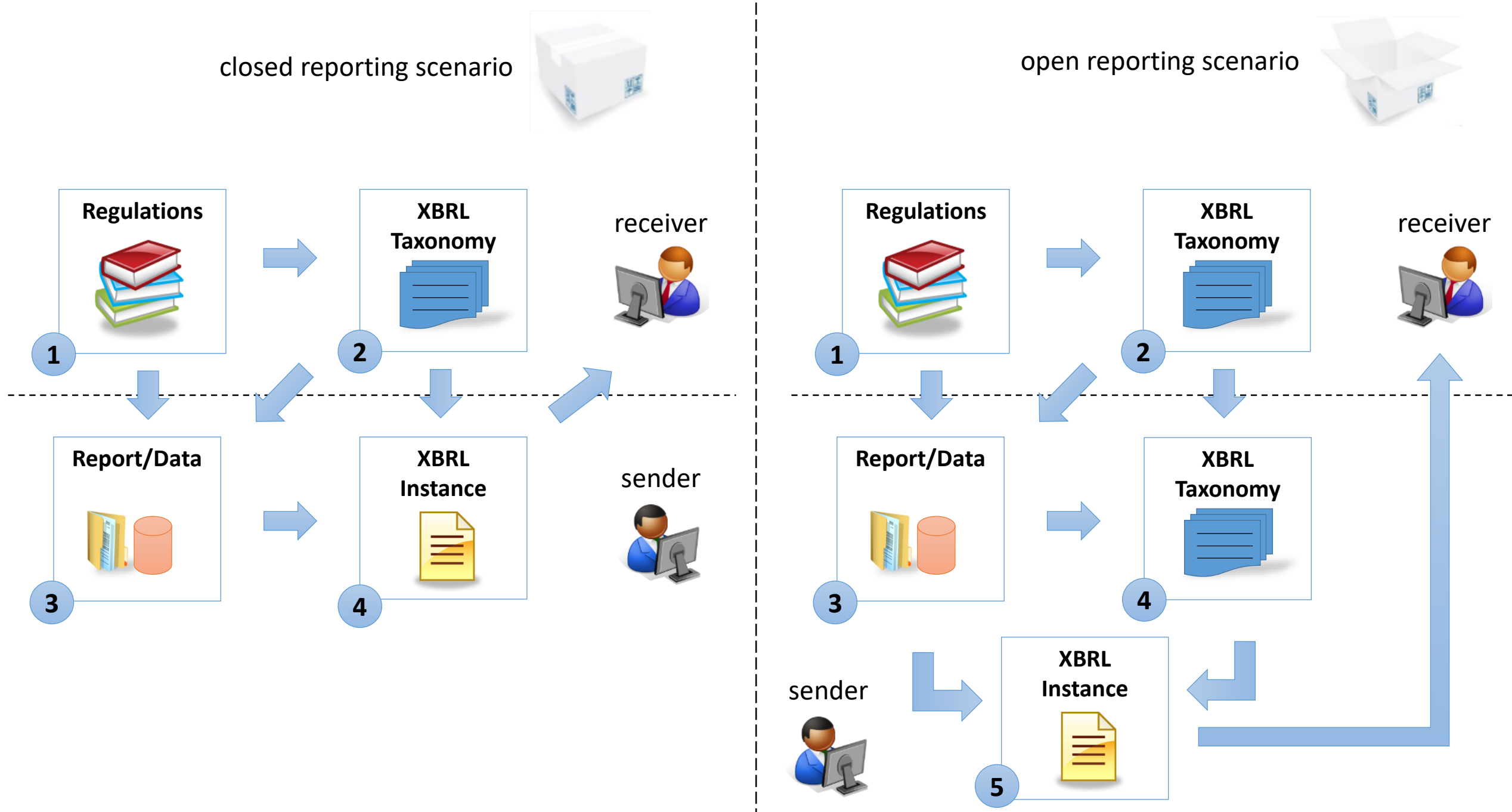
<https://www.sec.gov/ix?doc=ixviewer/samples/bst/out/bst-20160930.htm>

		September 30, 2016	December 31, 2015
		(unaudited)	(unaudited)
		(in thousands, except share and per share data)	
<b>ASSETS</b>			
<b>CURRENT ASSETS</b>			
Cash and equivalents		\$ 288,783	\$ 362,786
Accounts receivable, less allowance for doubtful accounts (2016 - \$30,676; 2015 - \$19,180)		1,583,565	1,341,025
Inventories of parts and supplies, at cost		2,548,897	2,342,304
Prepaid expenses and other current assets		344,682	292,003
<b>TOTAL CURRENT ASSETS</b>		<b>4,765,927</b>	<b>4,338,118</b>
Goodwill and other intangibles, less accumulated amortization		1,152,164	448,055
Deferred tax assets		231,814	251,517
Other assets		415,955	578,937
Property, plant and equipment, less allowance for depreciation (2016 - \$733,383; 2015 - \$683,676)		583,653	509,729
<b>TOTAL ASSETS</b>		<b>\$ 7,149,513</b>	<b>\$ 6,126,356</b>
<b>LIABILITIES AND EQUITY</b>			
<b>CURRENT LIABILITIES</b>			
Accounts payable		\$ 1,991,871	\$ 1,513,710
Current portion of long-term debt		525,506	225,000
Income taxes payable		17,258	3,919
Dividends payable		74,684	68,977
Other current liabilities		499,365	427,269
<b>TOTAL CURRENT LIABILITIES</b>		<b>3,108,684</b>	<b>2,238,875</b>
Long-term debt		225,000	225,000
Pension and other post-retirement benefit liabilities		433,200	515,689
Deferred tax liabilities		81,526	-
Other long-term liabilities		463,246	439,431
<b>EQUITY</b>			
Preferred stock, par value--\$1 per share			
Authorized--9,000,000 shares -- none issued		0	0
Common stock, par value--\$1 per share			
Authorized--405,000,000 shares			
Issued--2016 -- 138,921,478; 2015 -- 139,357,294		138,921	139,357
Retained earnings		3,213,320	3,010,084
Accumulated other comprehensive loss		(523,487)	(451,343)
<b>TOTAL PARENT EQUITY</b>		<b>2,828,754</b>	<b>2,698,098</b>
Noncontrolling interests in subsidiaries		9,103	9,263
<b>TOTAL EQUITY</b>		<b>2,837,857</b>	<b>2,707,361</b>

[https://www.ifrs.org/-/media/feature/about-us/funding/ixbri\\_ifrsf\\_2018-05-14.zip?la=en](https://www.ifrs.org/-/media/feature/about-us/funding/ixbri_ifrsf_2018-05-14.zip?la=en)

# Other aspects related to XBRL taxonomies

# What are the reporting scenarios?



- XBRL taxonomy extensions disallowed
- tagged data:
  - standard/predefined tags
  - expandable constructs

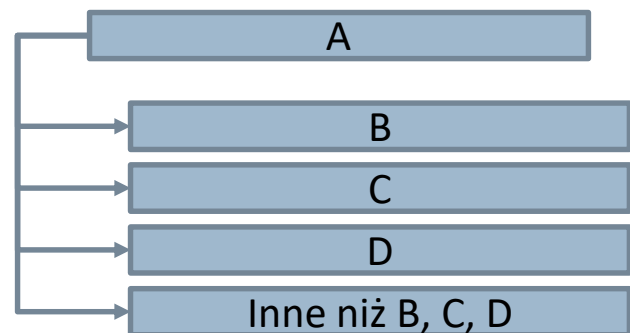
- extensions allowed
  - controlled
  - no rules or constraints

# What is X in XBRL?

- extensibility of syntax and semantics, e.g. defining new types of business terms and expressing new kinds of relations between business terms
- extensibility of taxonomy content (concepts, labels, relations, ...)

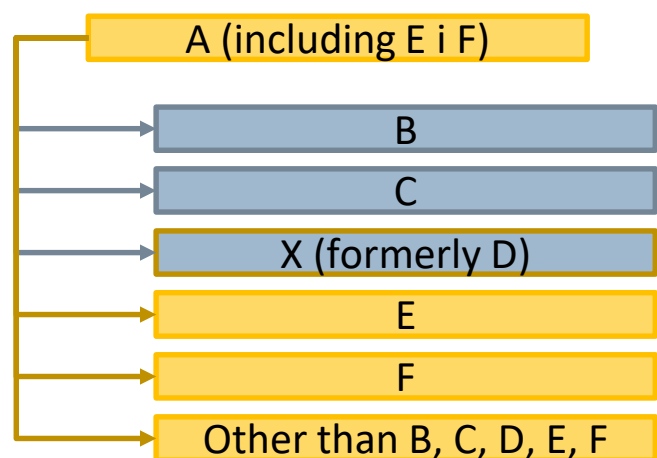
Example:

Concepts and relations in the base (e.g. IFRS or US-GAAP taxonomy)

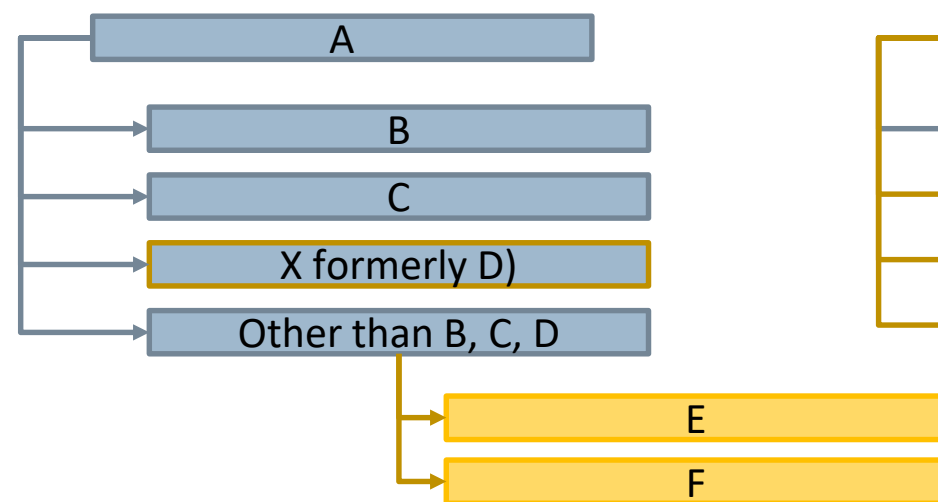


Company extension – need to include company specific concepts: E and F and rename D for X

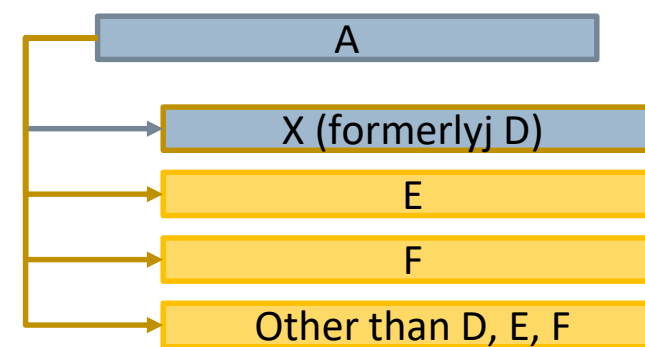
Extension taxonomy 2:



Extension taxonomy 1:



Extension taxonomy 3:



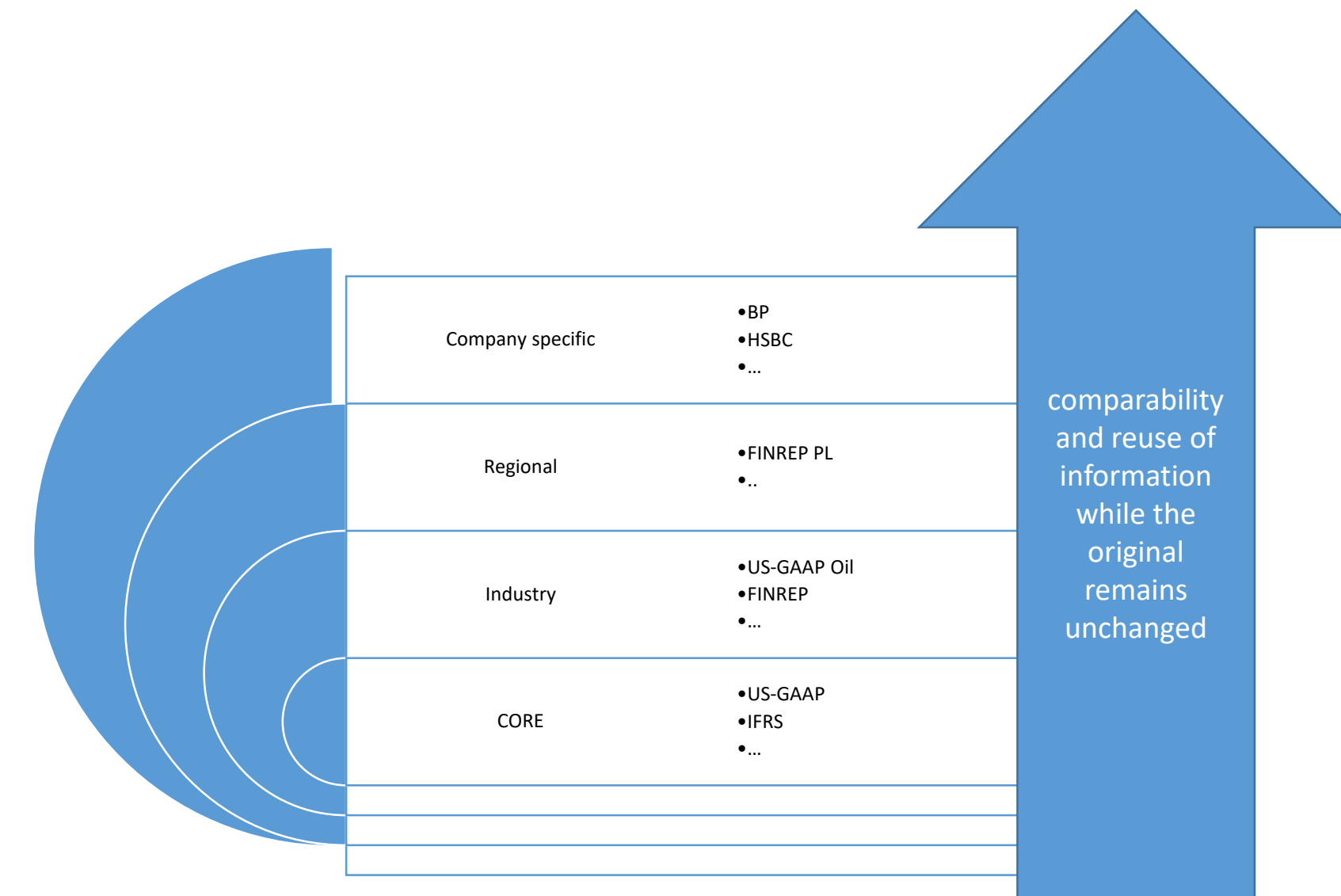
CONSOLIDATED INCOME STATEMENT				
Notes	2011	2010	2009	
	(in EUR thousands)			
3	302 857	274 404	214 815	
	168 143	161 525	129 779	
	<b>Gross profit</b>			
	Selling expenses			
	General administration expenses			
	Research and development costs			
5	Other operating income			
6	Other operating expenses			
7	<b>Operating result</b>			
	Finance income			
	Finance expense			
9	<b>1 256</b>	<b>3 166</b>	<b>1 758</b>	
	<b>63 981</b>	<b>35 655</b>	<b>22 401</b>	
	<b>Result before taxes</b>			
	Taxes on income			
	19 215	12 661	5 151	
	<b>44 766</b>	<b>22 994</b>	<b>17 250</b>	
	<b>Net income for the year (after taxes)</b>			
	Basic earnings per share (€)			
	0,49	0,26	0,2	
	<b>Diluted earnings per share (€)</b>			
23	0,48	0,25	0,19	

Annual Report  
**ABC Company**

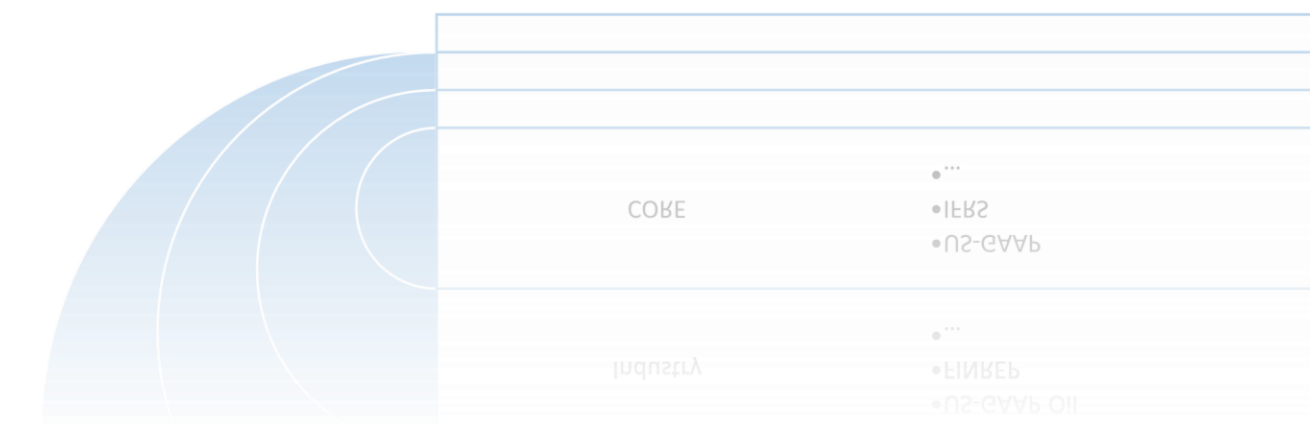
CONSOLIDATED INCOME STATEMENT	2
CONSOLIDATED STATEMENT OF FINANCIAL POSITION	3
CONSOLIDATED STATEMENT OF CASH FLOWS	4
CONSOLIDATED STATEMENT OF CHANGES IN EQUITY	5
Notes	6
3. Note - Segment reporting	6
12. Note - Property, plant and equipment	7

Clear indication of the change and its impact on semantics

# What is the purpose of extending taxonomies?



- **definition:** modifying of a taxonomy without changing its code (base/core taxonomy must remain unchanged) but reusing already defined concepts and structures (comparability)
  - supports comparability
  - helps understanding differences, their reasons and consequences (more semantics)
- **goal:** adapting already existing taxonomies (esp. these approved by XII) for a need of an industry or a regulator keeping maximal scope of data comparison
- **depends on:**
  - scope
    - small extensions may modify base taxonomy
    - large extension should be build from scratch (reuse only concepts and dimensional breakdowns if possible)
  - design of the base taxonomy:
    - schema defining concepts refers linkbases
    - schema defining concepts independent from relations (most common situation, e.g. IFRS, US-GAAP)
  - approach for alignment with the base taxonomy
    - direct
    - indirect (e.g. by relations)
- **types:**
  - *adding elements*
  - *modifying (adding or prohibiting) relations*



# What is the process and syntax used in extending taxonomies?

creating extensions = adding new elements and relationships (arcs) with appropriate attributes

1. creation of a new taxonomy
2. import of a base taxonomy
3. definition of new elements and other components (e.g. sets of relations) in new taxonomy
4. operations on relationship arcs in new linkbase files (referring to base sets of relations):

- prohibiting
- overriding (setting priority)

attributes and characteristics applied:

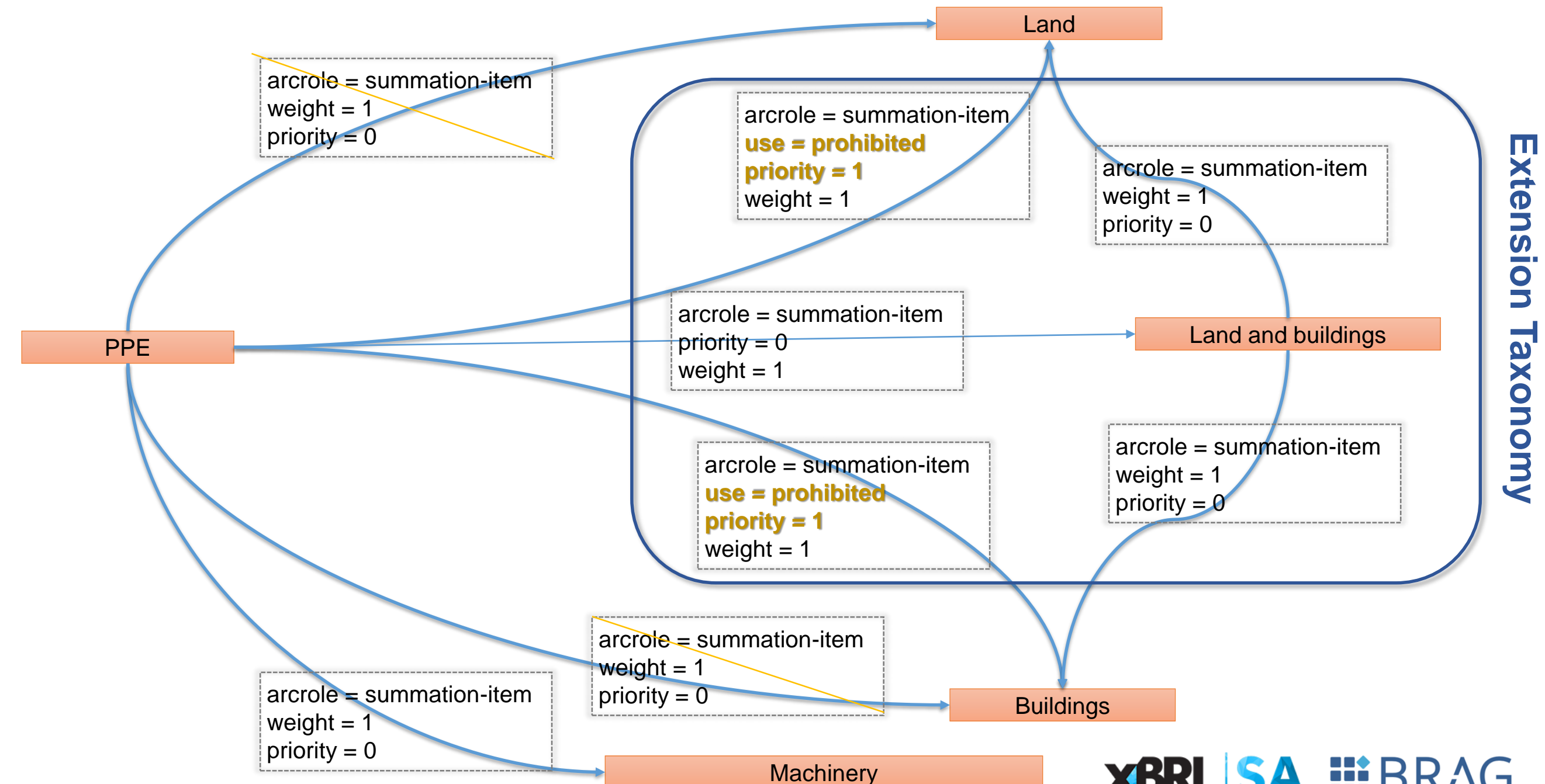
- use attribute
  - "optional" (default value) - indicates that an arc represents a relationship that is considered in the network of relations
  - "prohibited" - indicates lack of a relationship between elements connected via an arc
- priority attribute
  - integer (default value: "0")
  - rank of relationships: relationship has a priority equal to the value of this attribute (the higher value the higher priority of a relationship)
- *concept of equivalency and overriding relations*

base taxonomy:

Land	100
Buildings	200
Machinery	300
<b>PPE</b>	<b>600</b>

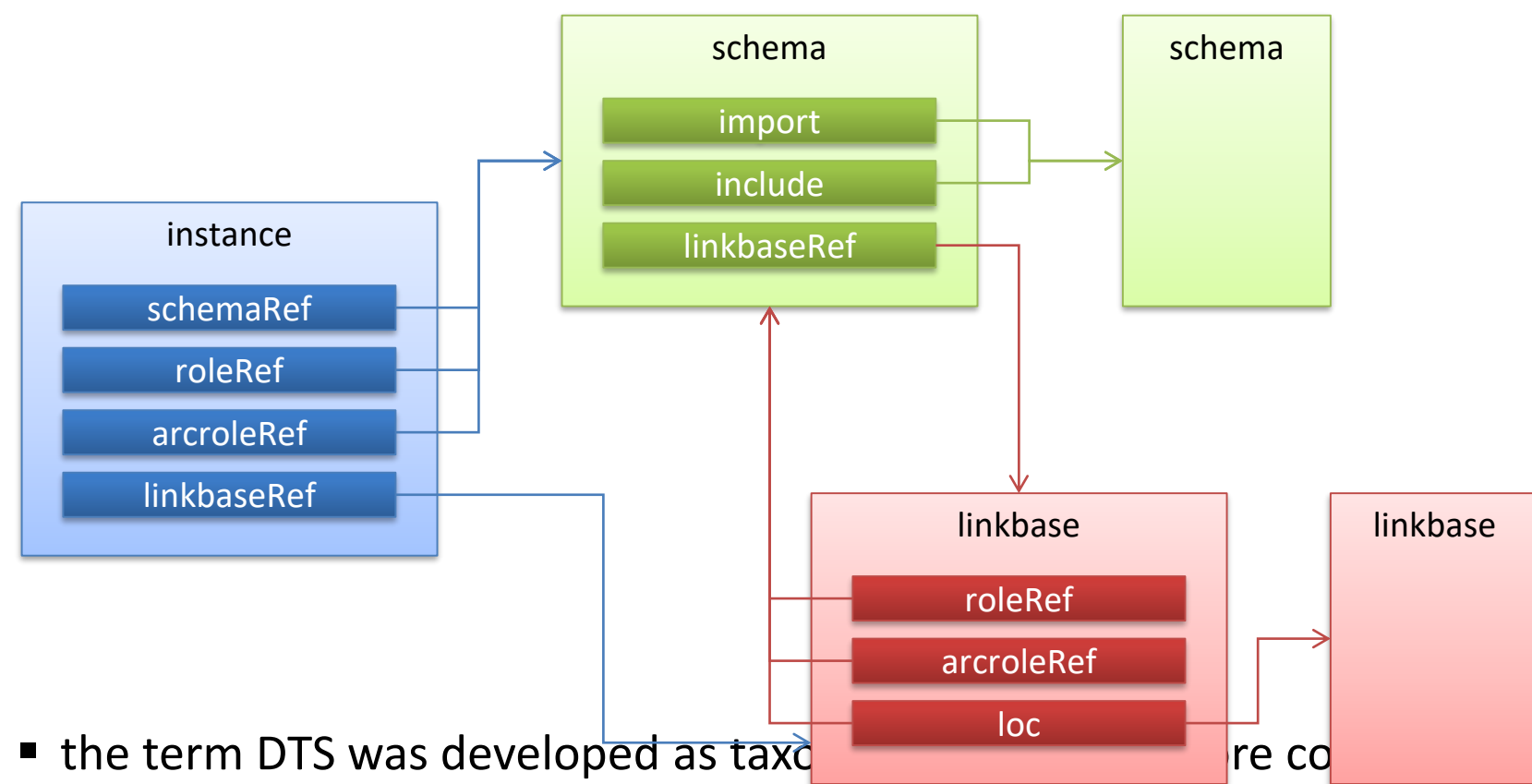
extension taxonomy:

Land and buildings	300
<i>Land</i>	<i>100</i>
<i>Buildings</i>	<i>200</i>
Machinery	300
<b>PPE</b>	<b>600</b>

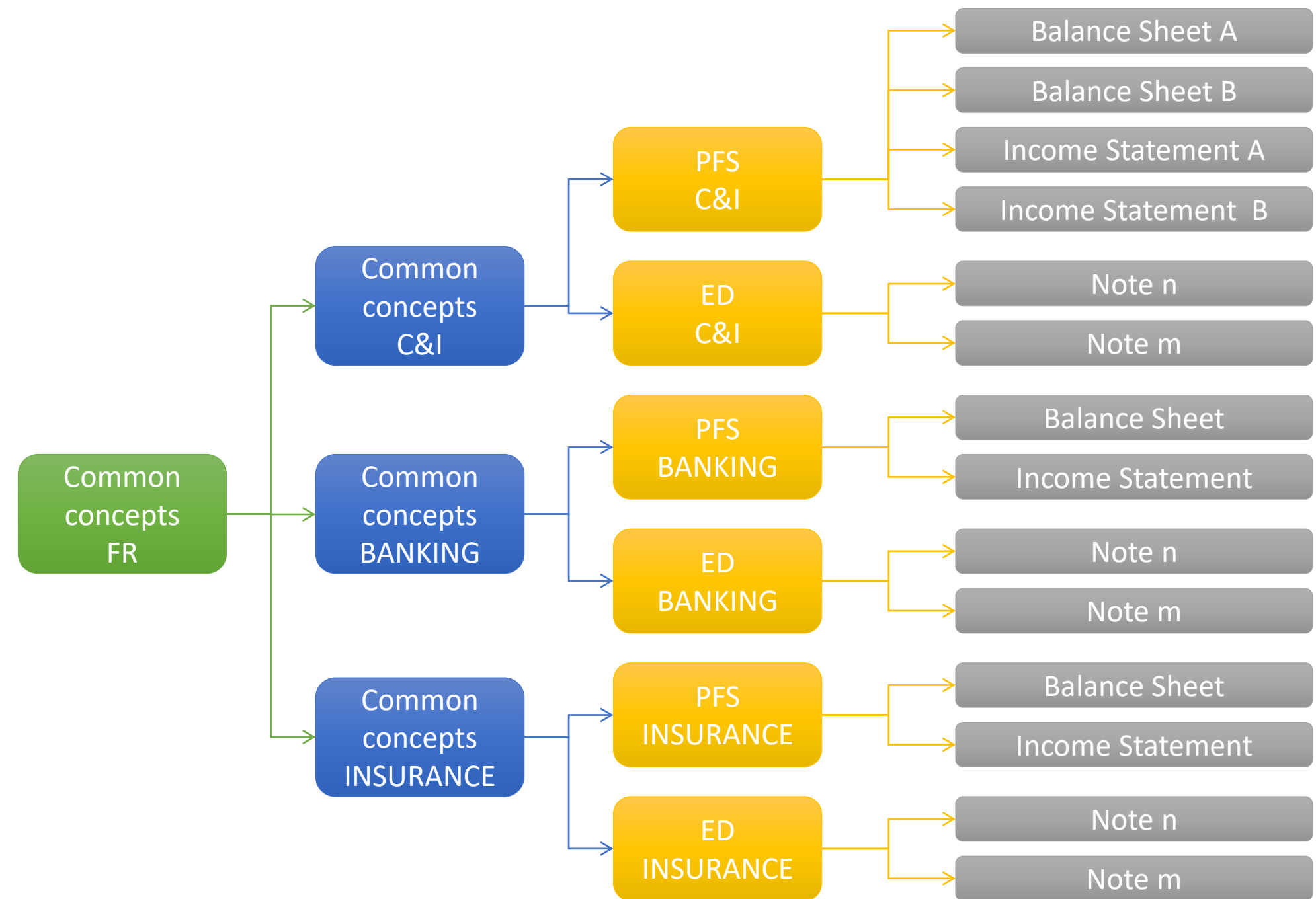


# What is taxonomy modularization?

- XBRL Taxonomy is not a single file (although can be)
- DTS (Discoverable Taxonomy Set) used for naming large taxonomy frameworks built from reusable chunks decreasing redundancy and facilitating maintenance
- set of taxonomies (XBRL schema files and linkbase files) discoverable over the xlink:href attribute used on different elements



- the term DTS was developed as taxonomy (100+ files) and more closely related to one other
- from XBRL perspective division in files is less important than division in extended link roles (ELRs)

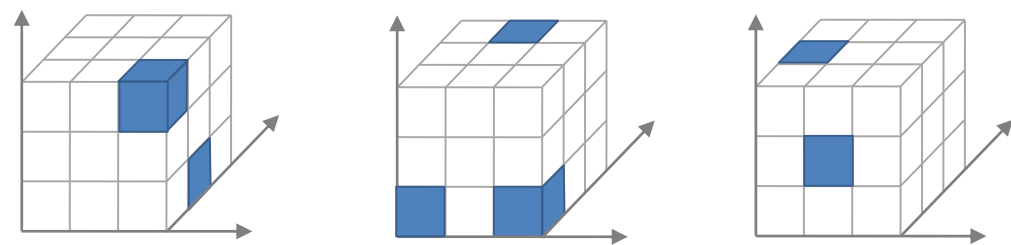




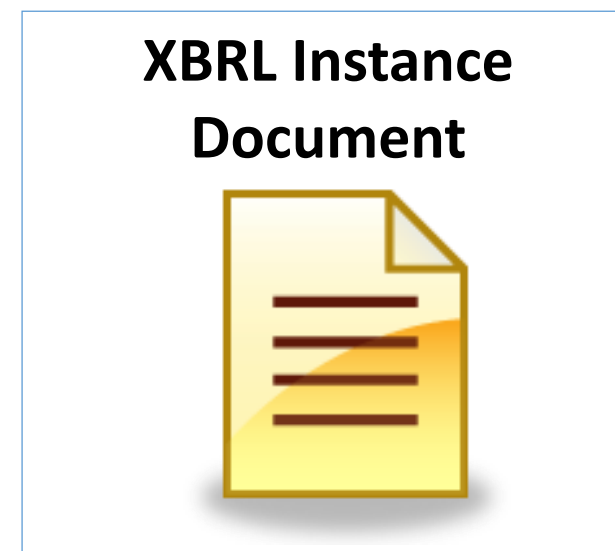
# XBRL formula

# Why was XBRL Formula invented?

- validation capabilities of XBRL (according to XML, XBRL 2.1 and Dimensions 1.0):
  - general structure, e.g. well-formed, use of declared tags, nested structures (tuples), required attributes (decimals/precision, contextRef, etc.)
  - data types
    - restriction to numeric, boolean, enumerations, patterns, ranges ...
    - reference to the unit of measure (for monetary: iso4217, pure and shares)
  - instant or duration context
  - calculation linkbase
    - simple expressions:  $A = \pm X \cdot B \dots$
    - single context and unit, ...
    - Cr/Dt
  - definition linkbase
    - requires-element*
    - validity against hypercubes (control over reported data)
- messaging of errors/warnings/notifications:
  - difficult to understand (usually technical vocabulary and reference to code)
  - dependent on the application used
  - no possibility of customization (at least on the taxonomy level)
- what is missing:
  - cross context (beginning period + changes in period = ending period)
  - cross unit (EPS = earnings in currency divided by shares)
  - cross dimensions
  - requiring and prohibiting facts (e.g. total value of assets must be reported, when reporting profit (loss) by function depreciation must not be reported, capital adequacy ration must be reported either by SA or IRB but not both)
  - validation of entity identifier and scheme, allowed reporting periods, units and precision used on facts, disallowing footnote, etc (reported information is only for first quarter of 2009, entity information is created for scheme <http://www.stockexchange.com/ticker> and the identifier is three capital letters, all monetary items are reported in USD and the precision is two decimal places, if capital adequacy ratio is between 8-10% then it must refer to a footnote)
  - automatic calculation of not reportable aggregates/indices and/or comparing these computed values with reported facts (ratios, totals, etc) e.g. computation of capital requirements and validating against a reported fact

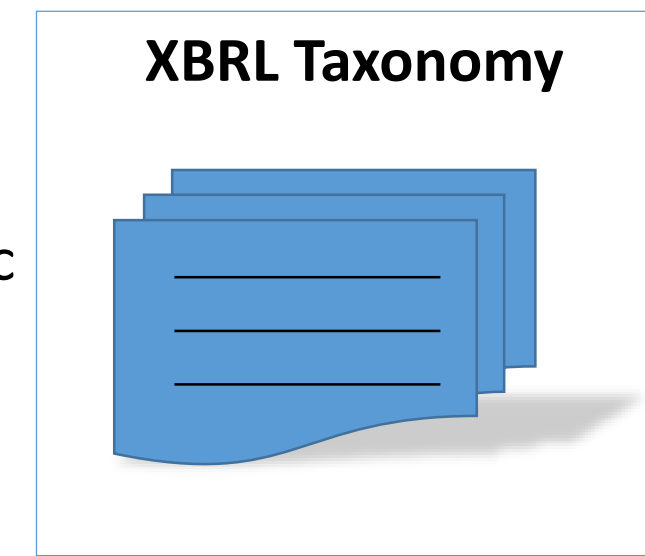


# What are the basic components of XBRL Formula?



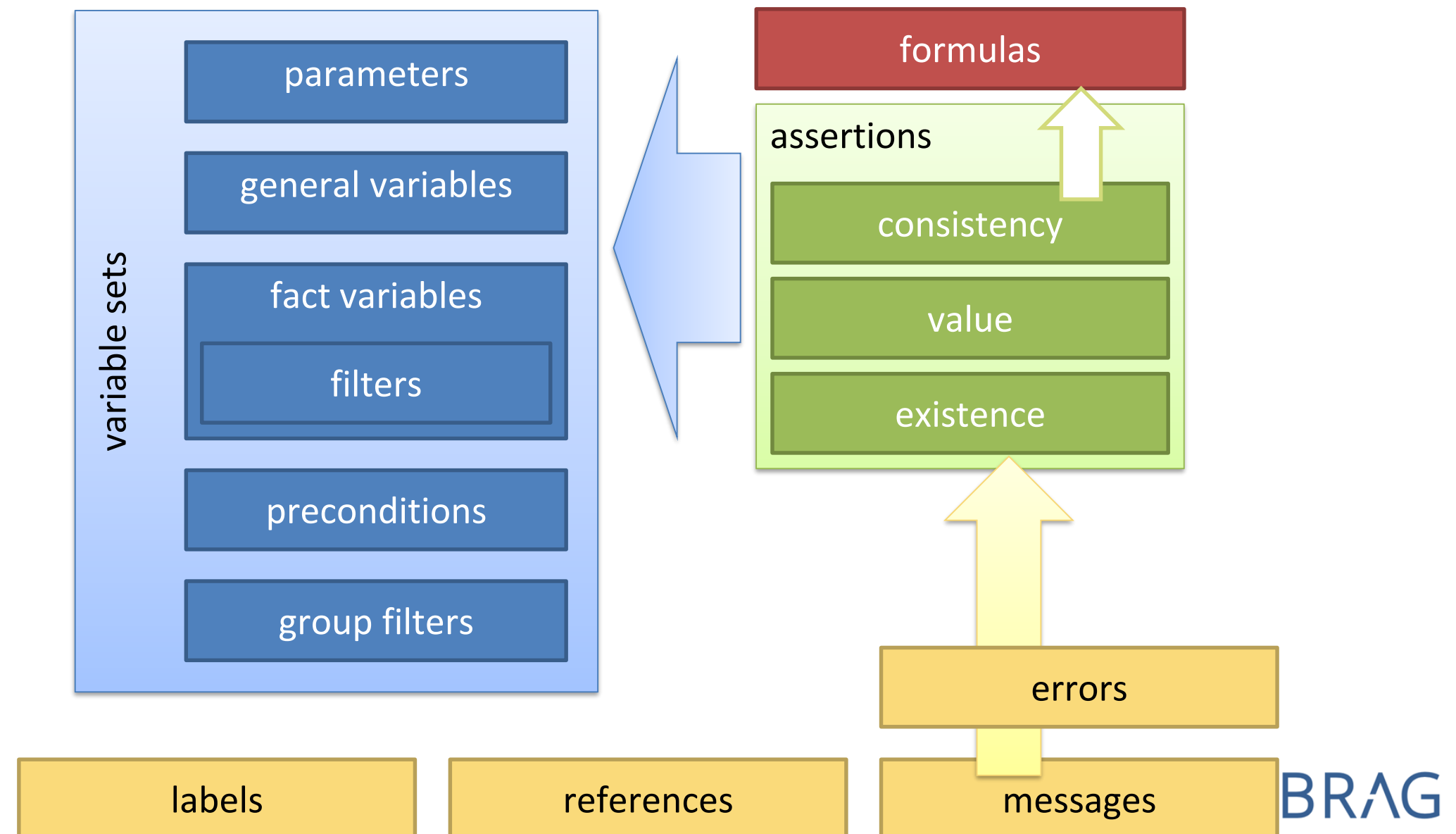
Querying and checking reported data (XPath, XQuery, XBRL Functions)

Declaration of rules (resources and arcs according to Generic Link)

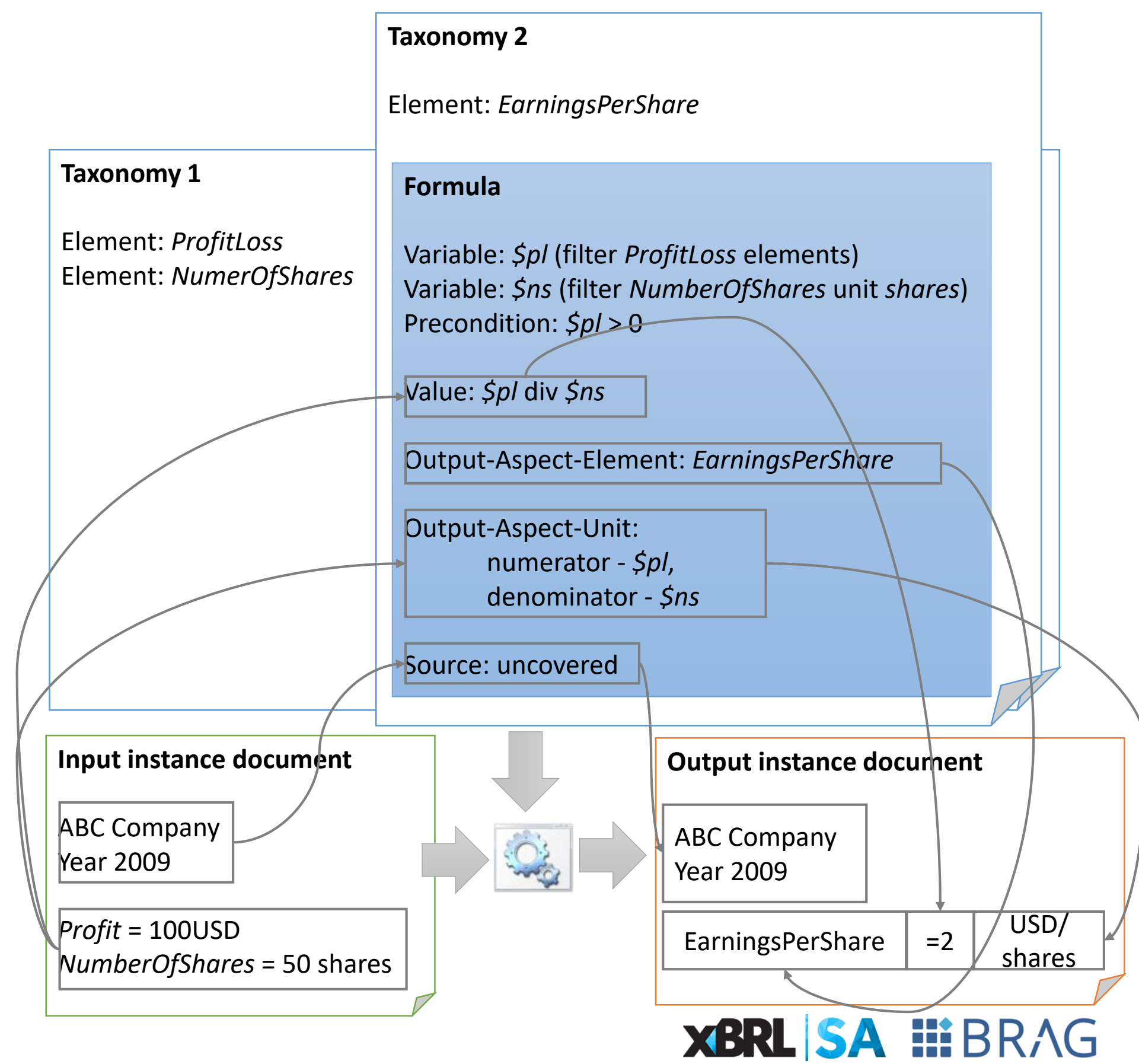
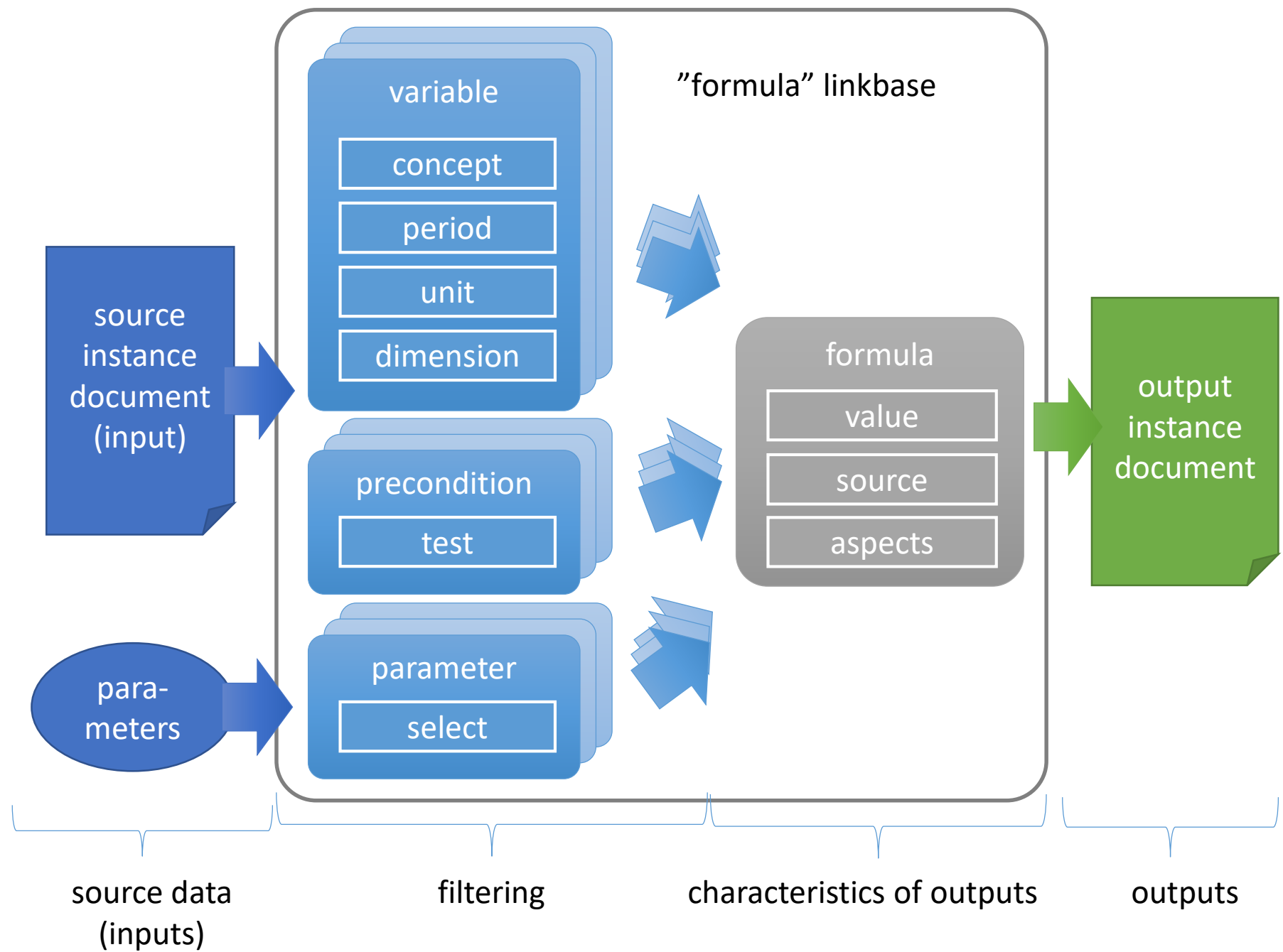


## Query language:

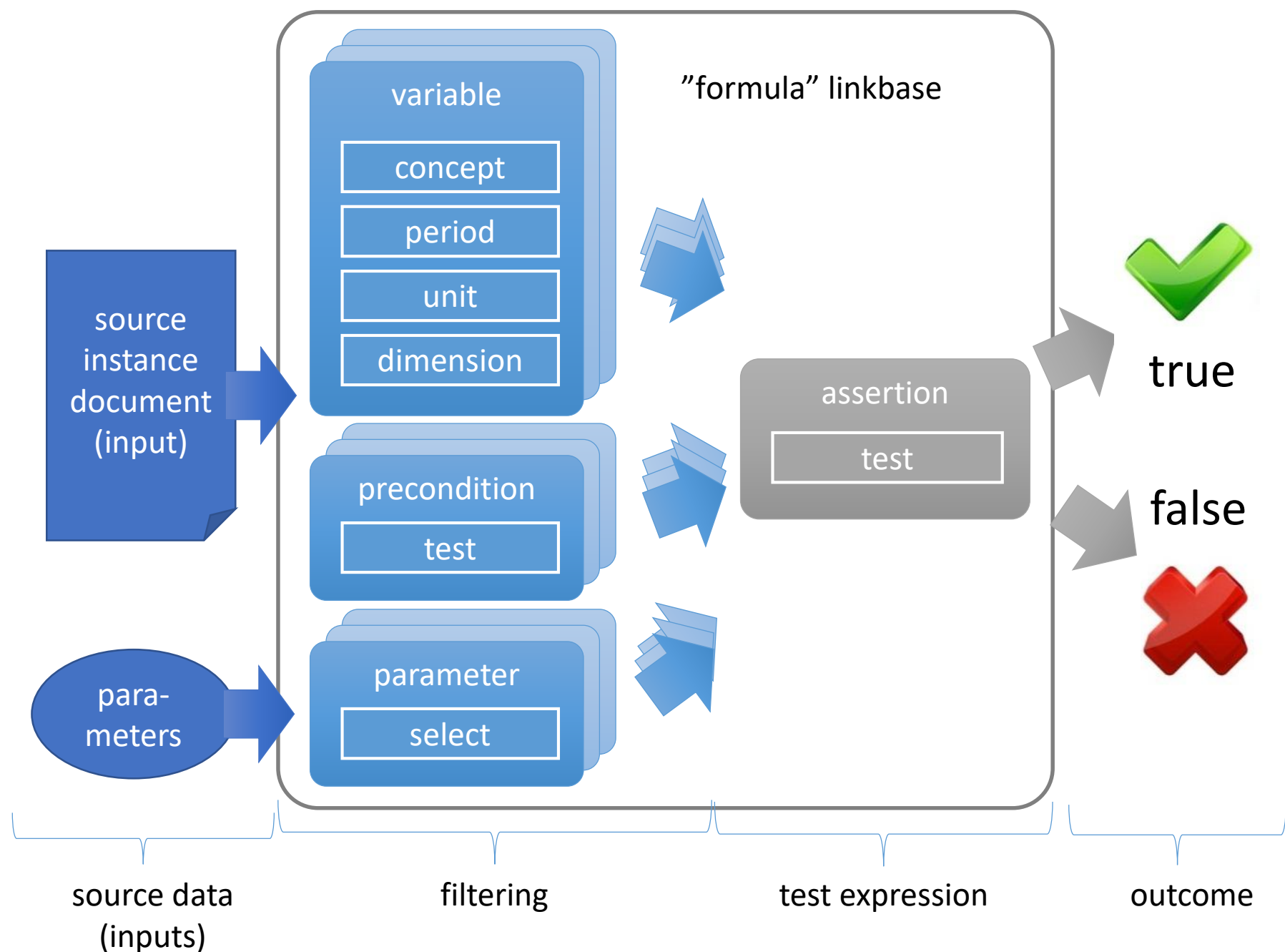
1. enables constructing queries involving one or many items and their properties
2. declarative (algorithms not needed)
3. returns output values in the same format as input values and allows modifying queried information (aggregate, count average, etc.)



# How does a formula work?



# How does an assertion work?



**Taxonomy**  
 Element: *Assets*  
 Element: *Equity*  
 Element: *Liabilities*

**Value Assertion**  
 Variable:  $\$a$  (filter *Assets* if missing 0)  
 Variable:  $\$e$  (filter *Equity* if missing 0)  
 Variable:  $\$l$  (filter *Liabilities* if missing 0)  
 Test:  $\$a = \$e + \$l$

**Input instance**

ABC Company  
 Year 2011  
 Assets = 100USD  
 Liabilities = 80USD  
 Equity = 20USD

Year 2012  
 Assets = 90USD  
 Liabilities = 70USD  
 Equity = 10USD

true for 2011

false for 2012

**Taxonomy**  
 Element: *Assets*  
 Element: *Association*

**Existence Assertion**  
 Variable:  $\$at$  (filter element *Assets*), period: 2009

**Existence Assertion @test='true'**  
 Variable:  $\$as$  (filter element *Association*)

**Input instance**

ABC Company  
 Year 2009  
 Assets = 100USD  
 Association='true'

Year 2008  
 Assets = 90USD

true for  $\$at$

false for  $\$as$

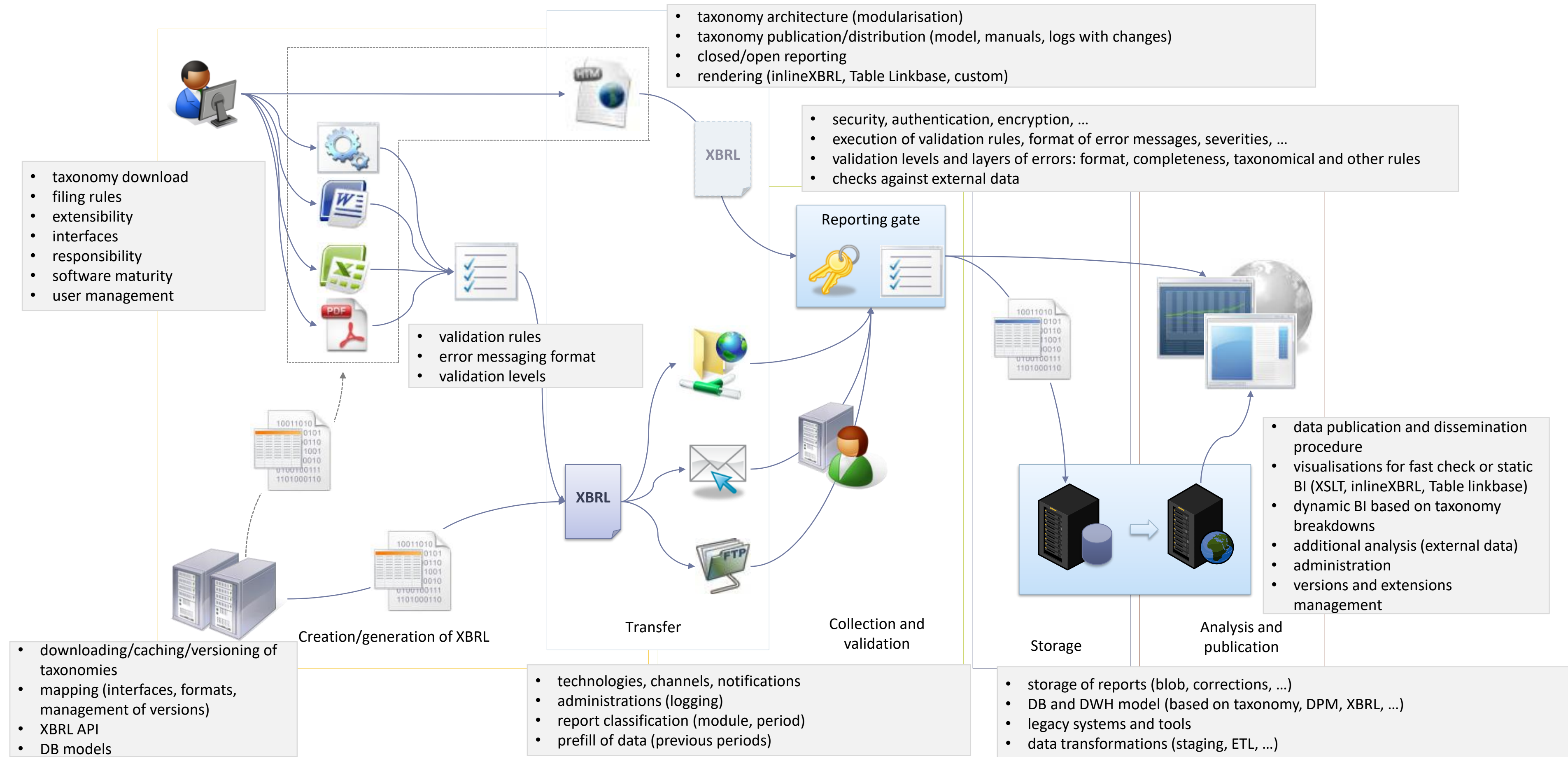
# What are generic messaging?

- dynamically generated messages (document events)
- XPath expressions: conditional, calculating something
- trigger points: satisfied/unsatisfied
- severity is currently a custom implementation (although technical artefacts to define it are in place)

```
<msg:message xlink:type="resource"
xlink:role="http://www.xbrl.org/2010/role/verboseMessage" xml:lang="en">
<b>Inconsistency</b>in<label css="computer">{node-name($parent)}</label>
in context {$parent/@contextRef}, reported value <label
css="computer">{$parent}</label> , computed value <label
css="computer">{sum($weightedChildValues)}</label></msg:message>
```

# Implementation aspects

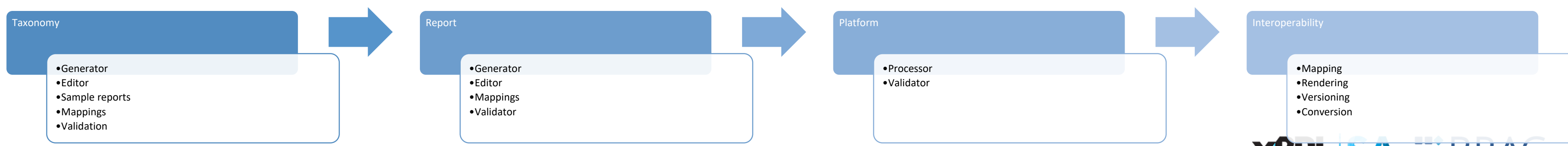
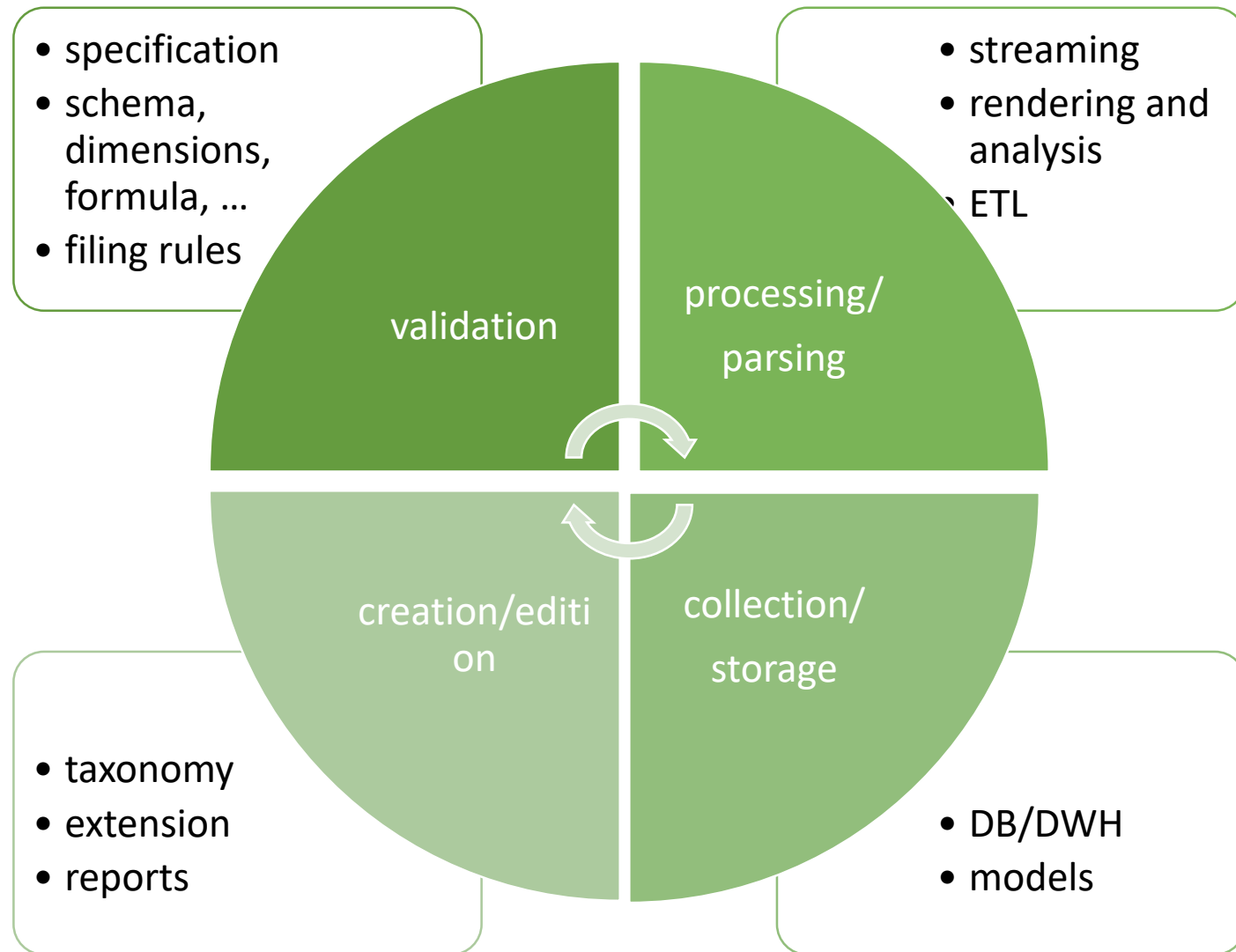
# How does XBRL impact the reporting chain??





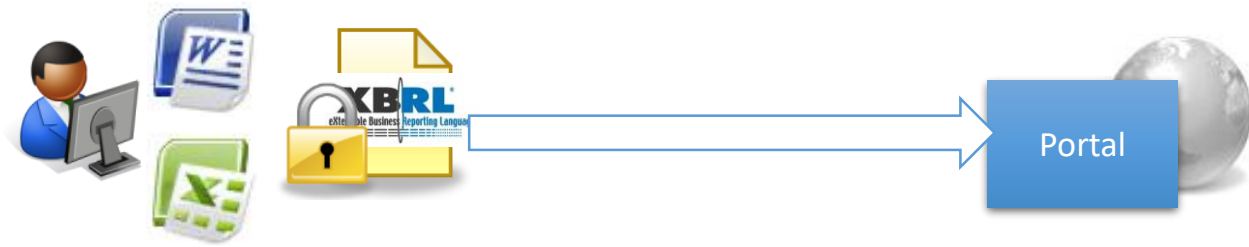
# What are the XBRL tools?

- over 300 licensed tools available on the market (excluding filing agencies which may have their own tools)
- over 150 software vendors identified
- over 40 open source tools available on the Internet (most of them cover only basic functionalities like instance viewing and editing)



# How XBRL can be implemented on the filer side and what is the challenge if not all data is exchanged in XBRL?

1. Receiver provides XBRL enabled excel, word, PDF templates



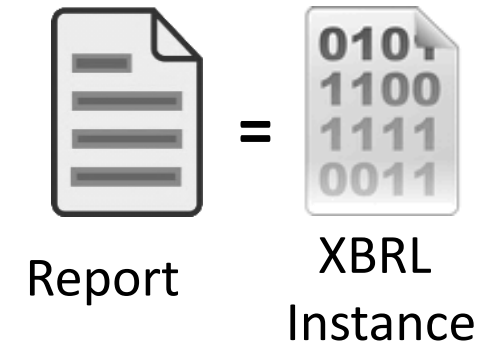
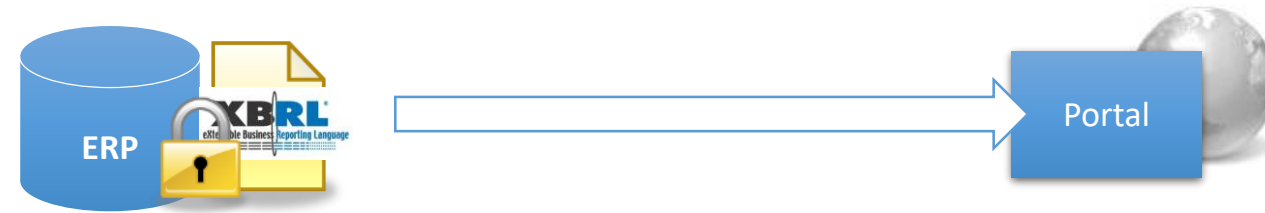
2. Outsourcing (printer, consultant, vendor to prepare reports )



3. Bolt-on (tools to transform your reports into XBRL at the last stage)



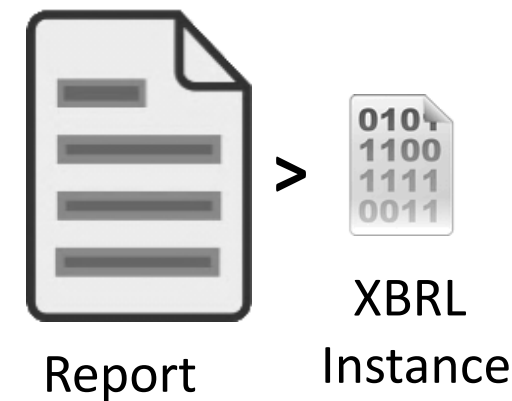
4. Integrate (build XBRL into company's business reporting supply chain)



- all data comes in XBRL
- works for supervision (all reporting entities must produce required information, mainly numeric and clear/topic focused strings)
- uncovered scope
  - extensions
  - expandable constructs
  - string garbage/HTMLItemType (repeated information)
- need for rendering (for preview)

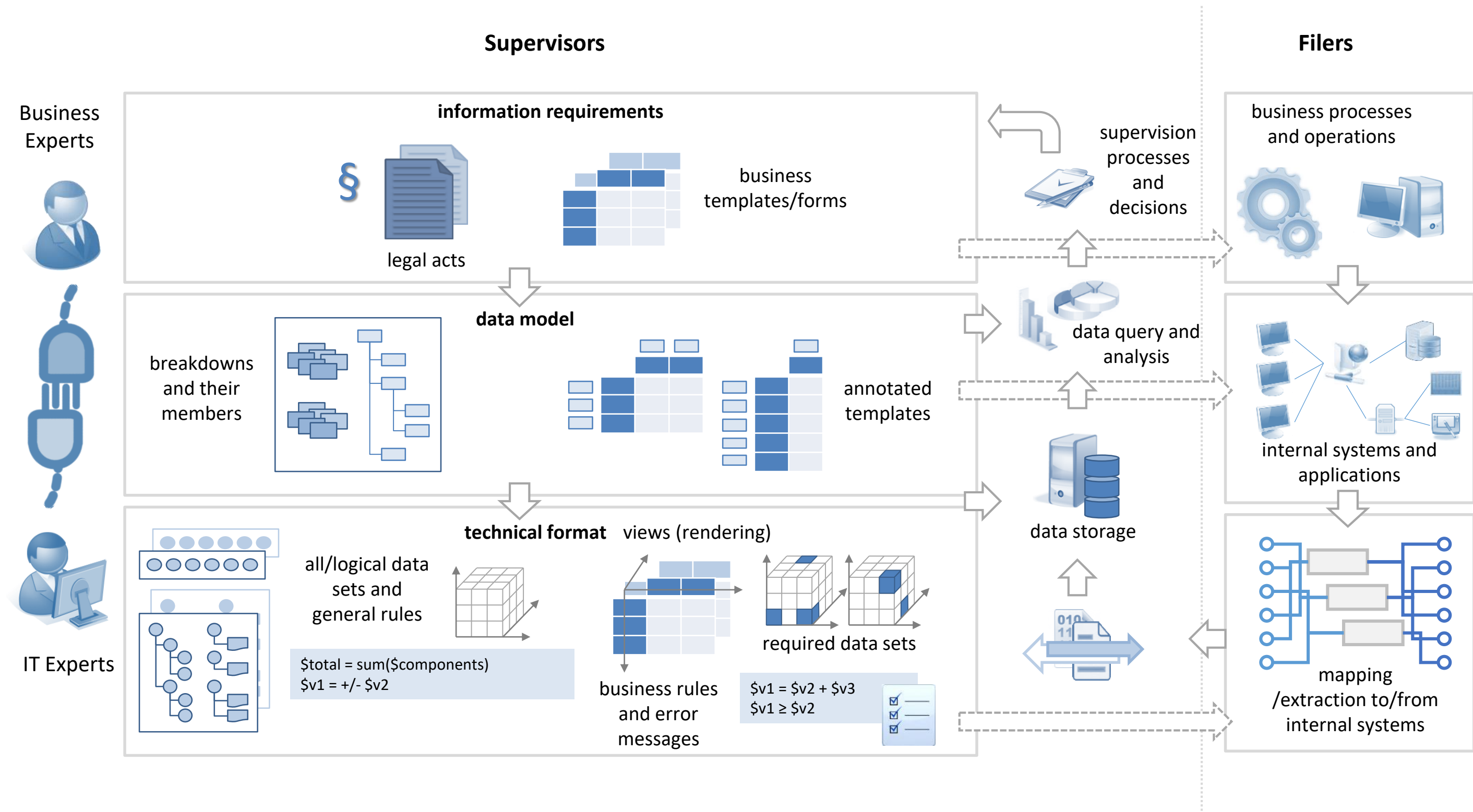
challenges:

- audit of tagged report
- assurance of tagging
- 1 or 2 documents
- missing tags
- rendering: WYSI(N)WYG



- tagged data is a **subset** of a report (comparable and most important information)
- usually Annual Report in other formats such as HTML (possibly with XBRL embedded as inlineXBRL), PDF

# How does the data exchange solution life cycle look like?



A decorative graphic on the left side of the slide, consisting of a network of white dots connected by thin white lines, forming a complex, interconnected web-like structure.

# Questions?