EBA's and EIOPA's Meet-the-market Event

28th Eurofiling Conference

Outline

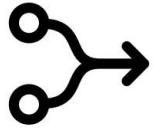|	
1	Background
2	Evolution of regulatory data definition
3	Evolution of regulatory data validation
4	Evolution of regulatory data exchange
5	Transition to DPM 2.0 and XBRL-CSV

❖ The EBA Data Point Model development **started in 2012**, to support the EBA reporting framework 2.0

❖ The DPM database was first **published by end 2013**, as part of the ITS 2.0 technical package

❖ Over the last **10 years**, the DPM database has been accumulating all the successive 17 main releases of the EBA data dictionary, from **release 2.0 to 3.3**

❖ The data dictionary **tracks changes** and maintains the full historization of all templates structure, data points categorisation, validation rules, and taxonomies, **across all releases**

❖ The DPM database is being used as a main component of EUCLID **data collection** (as it had been already with the previous ESP reporting system)

❖ The DPM database is also at the core of the EBA solutions for **data warehousing**, **data analytics**, and **data dissemination**

❖ The EIOPA on 2011 decided to implement the xBRL format for data exchange of regulatory reporting data

❖ The Data Point Model development **started in 2012**, to support the business & technical development of the Solvency 2 reporting framework

❖ The first DPM model was **published on 2013**, both on Excel and xBRL formats

❖ **In 2014** EIOPA developed the **Tool for Undertakings** to support the insurance companies on the creation of Solvency 2 on xBRL, **adopting the EBA's DPM database** as core central piece of the software solution

❖ **In 2015** EIOPA published the **Solvency 2, DPM and xBRL taxonomies**

❖ The EIOPA DPM has being evolving since then, covering in the **single glossary all the EIOPA's reporting frameworks**, including the **ECB add-ons** (insurance and pension funds) with the define-once approach

EBA-EIOPA collaboration

Use of DPM methodology	Integration through a single data dictionary	Building a metadata driven strategy	Facing challenges together	Working together in the development	Building a common long-term goal

The EBA and EIOPA collaboration on data standardisation since both authorities started to use DPM methodology	Both ESAs have being very successful on integrating their regulatory frameworks using a single data dictionary	Both, adopted the metadata-driven strategy as the way to respond to changes and reduce costs	Similar future challenges, made evident the advantages of more strong collaboration and harmonisation	Experts from both ESAs have been working on the new common data model, envisaging the common development of Data Definition standards and tools	As a long-term goal, this should play a key role to enable a semantic integration of a single financial dictionary for the whole financial sector

Total convergence of EBA and EIOPA methods, models, processes, and tools used for the development of data dictionaries and related regulatory products.

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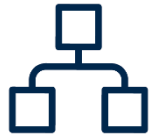
Unified metamodel applicable to all data exchanges, from highly aggregated data points to very granular data sets.

DPM methodology defined as **ISO standard**

Enabling subsequent **semantic integration** of data dictionaries across different regulatory domains

Evolution of regulatory
data definition

Defining better regulation

Basis of semantic layer for data analytics

Integration with data catalogue

Support data preparation

Definition and management data access policies

Definition and management of calculation and derivation rules

Definition and management of plausibility checks

Organisation of data storage model

Integrity checks of incoming data
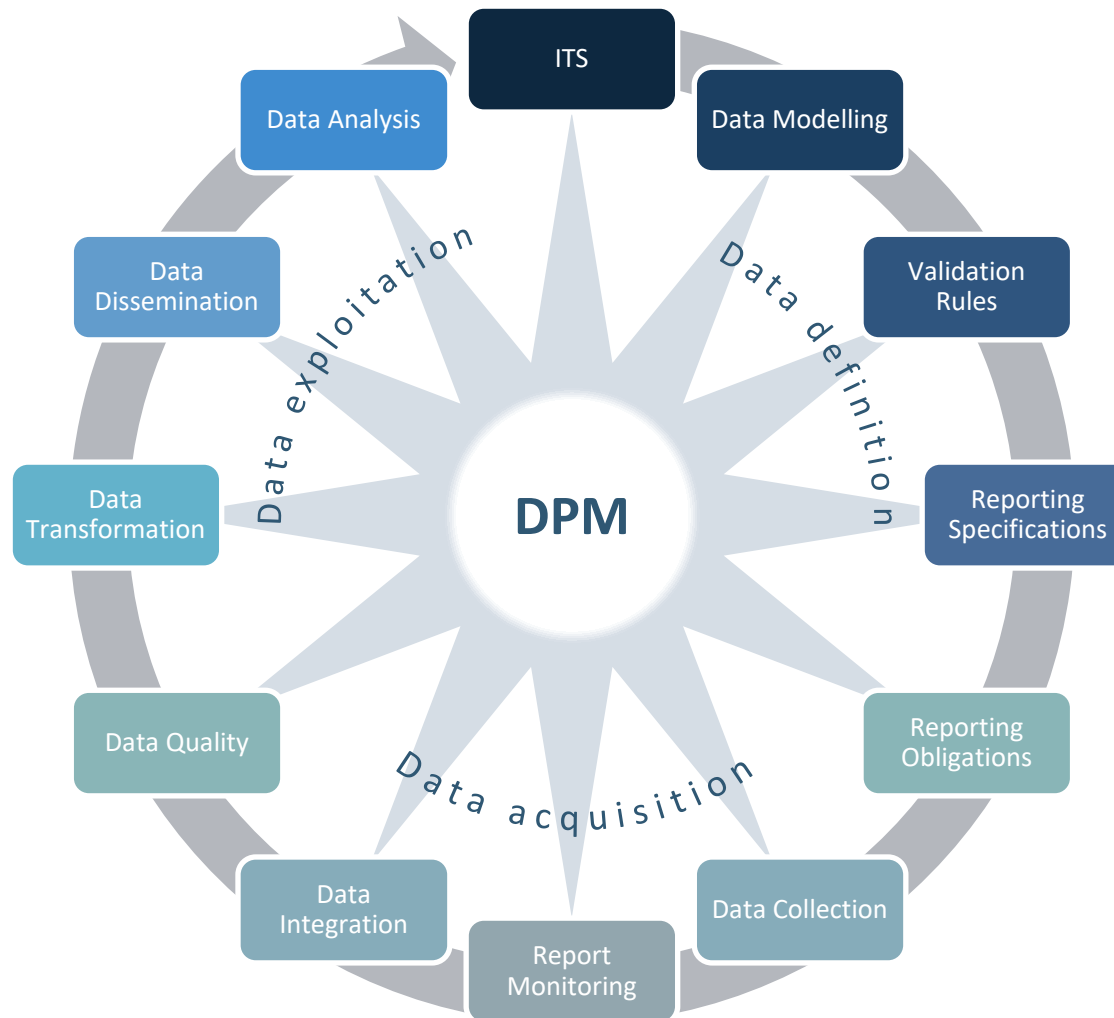
Better understanding of regulation

Definition and management of data requirements

Definition and management of validation rules

Basis for automatic generation of data exchange formats

Reference for defining the report compliance rules

Dynamic generation of data entry forms

Definition of the reporting calendar

Reference for checking report compliance

Central diagram:

ITS

Data Analysis — Data Modelling

Data Dissemination — Validation Rules

Data Transformation — Reporting Specifications

Data Quality — Reporting Obligations

Data Integration — Data Collection

Report Monitoring

DPM

Data exploitation — Data definition — Data acquisition

Data dictionary features	XBRL	DPM
▪ Formal definition of data requirements	☑	☑
▪ Glossary of business terms	☑	☑
▪ Dimensional data definitions	☑	☑
▪ Templates rendering	☑	☑
▪ Explicit metamodel	☒	☑
▪ Invariant data point identifiers	☒	☑
▪ Historisation of concepts and relationships	☒	☑
▪ Metadata exploration with standard query languages	☒	☑
▪ Verifiable global model consistency	☒	☑
▪ Support frameworks integration	☒	☑
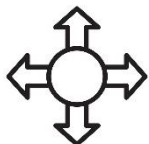
Agnostic

Not bound to particular data exchange standards

Rendering
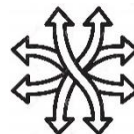
Enabling data visualisation in the template layout

Historisation

Keeping track of individual changes of data dictionary concepts across releases

Unified
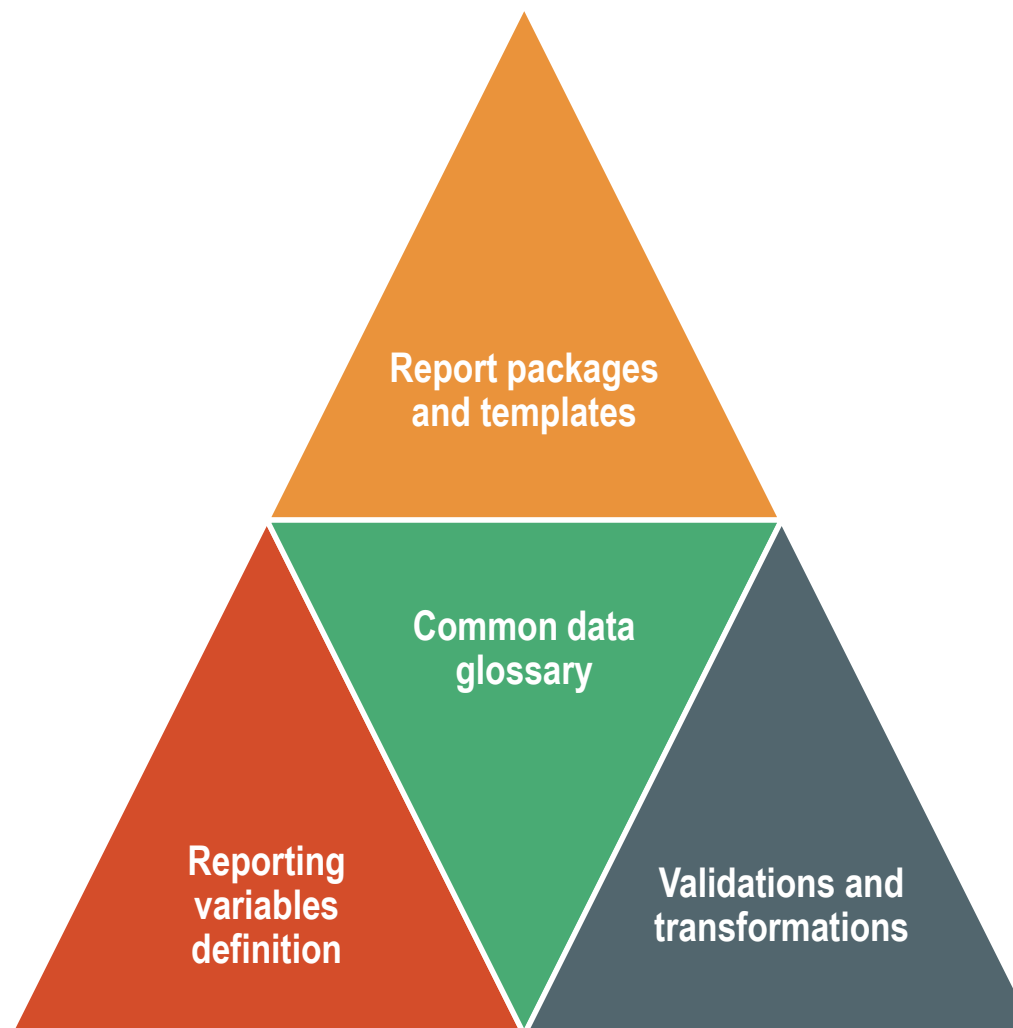
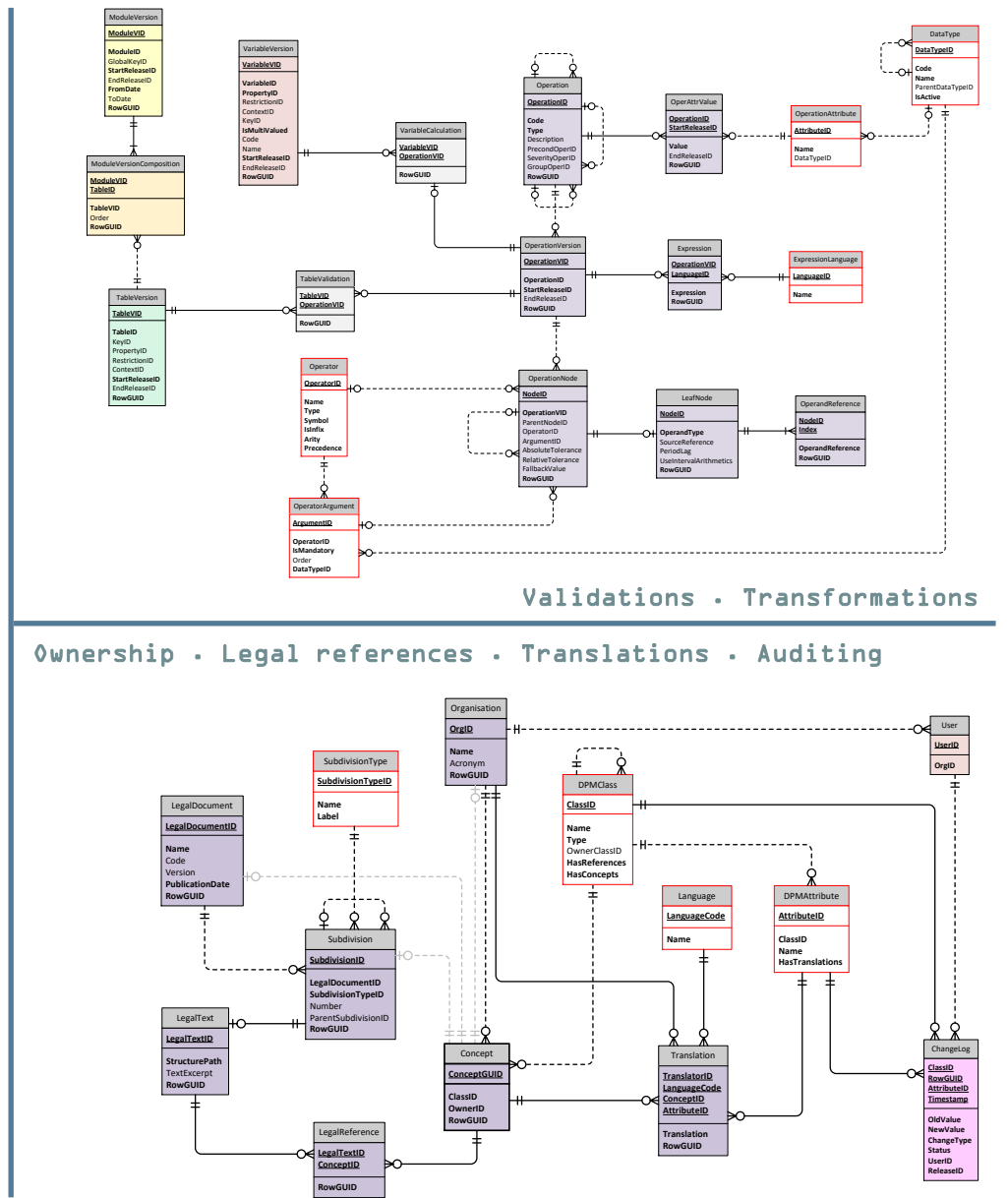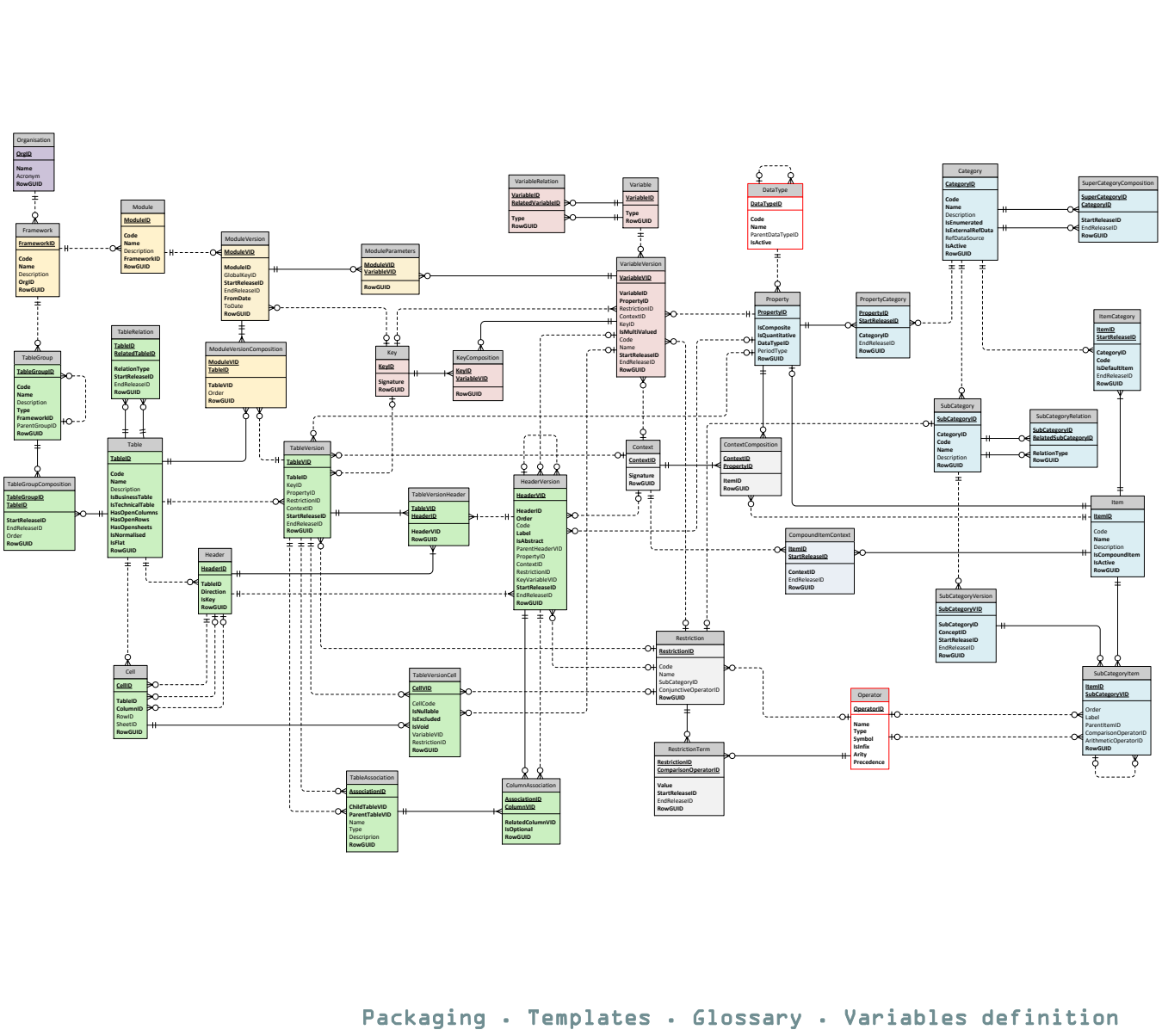Single metamodel supporting different types of data sets

Versatile

Compatible with different approaches for data requirements definition

Relationships

Support for primary/foreign keys and tables association

Validations . Transformations

Ownership . Legal references . Translations . Auditing

**Packaging . Templates . Glossary . Variables definition**

Evolution of regulatory
data validation

❖ The language used by EBA and EIOPA business experts to express validation rules, has been evolving over the years, but without a formal basis and proper documentation.

❖ Main issues with the current language are:

➢ Because it is not fully formal, it is not possible to have full automation when translating to other languages (notably to XBRL Formula).

➢ Although EBA and EIOPA are basically using the same language, there are some differences in the use that further difficult automation and common understanding.

➢ Extension of the language is difficult when there is no solid foundation (e.g. no consistency between operators).

❖ The new expression language (DPM XL) uses an improved syntax for expressing calculations and validations based on the DPM.

❖ It is based on the current language that the EBA and EIOPA have been using to write and share validation rules for several years.

↪ In practice, it is the result of a reverse-engineering process to formalize the language that already existed, with the minimum necessary changes.

❖ It is a fully formal language, which allows:

▶ Syntactical and semantical analysis to check correctness.

▶ Fully automated translations to other languages (e.g., XBRL Formula, VTL, SQL…).

▶ Building interpreters able to execute the rules as written.

❖ The existing validation rules are parsed, converted, and loaded into the DPM Refit according to the new syntax rules.
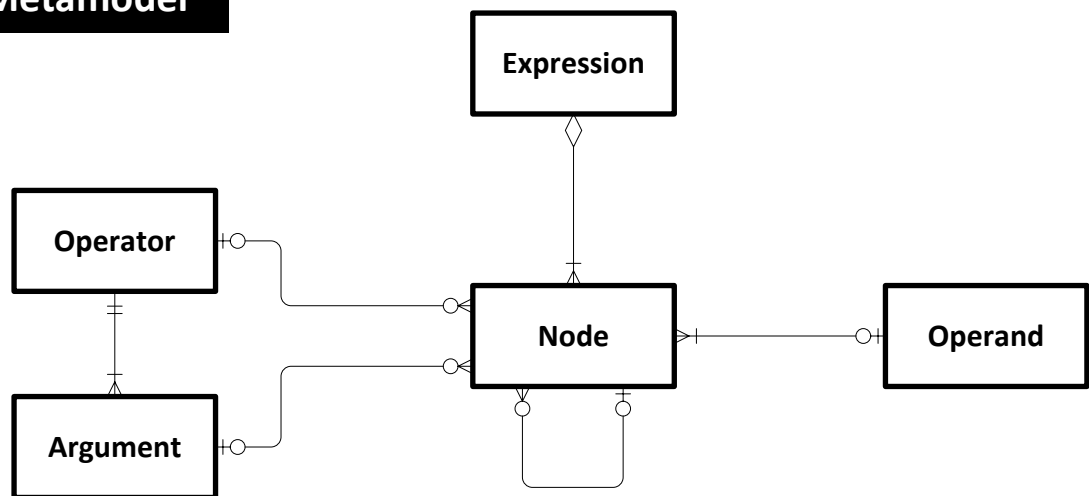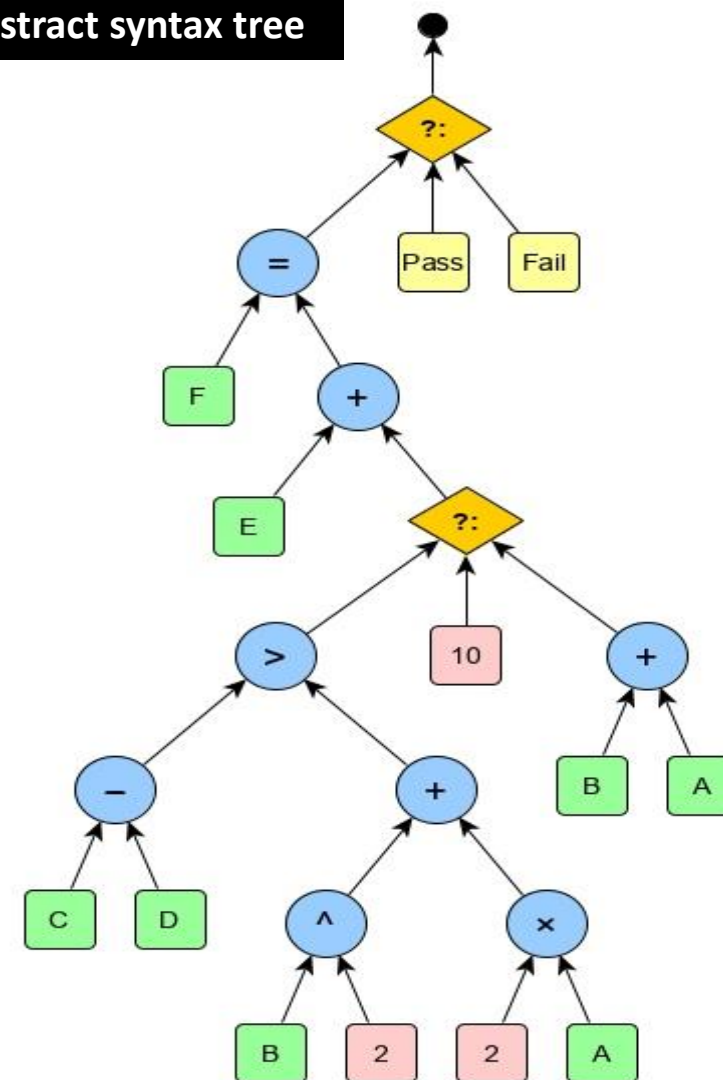
Definition

Execution
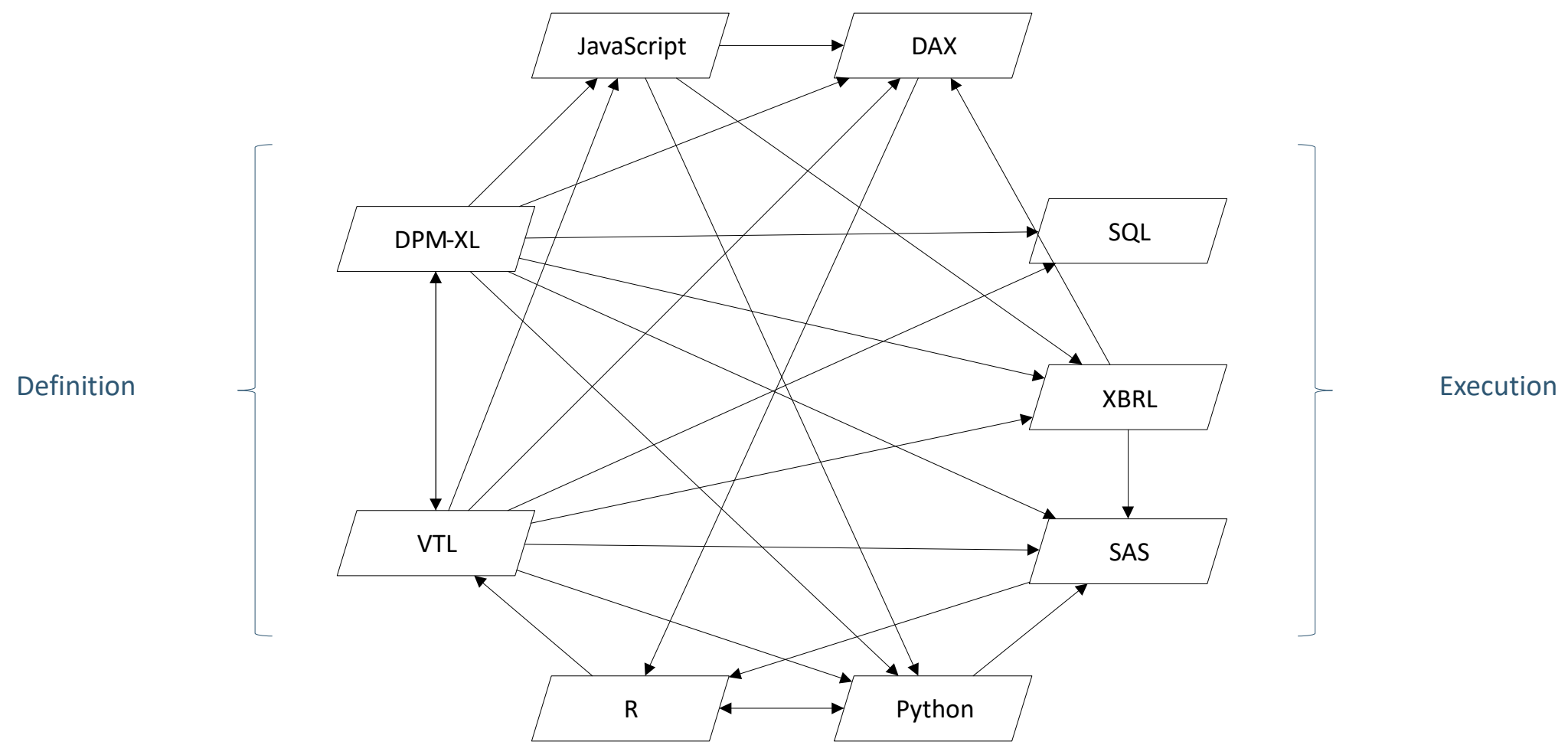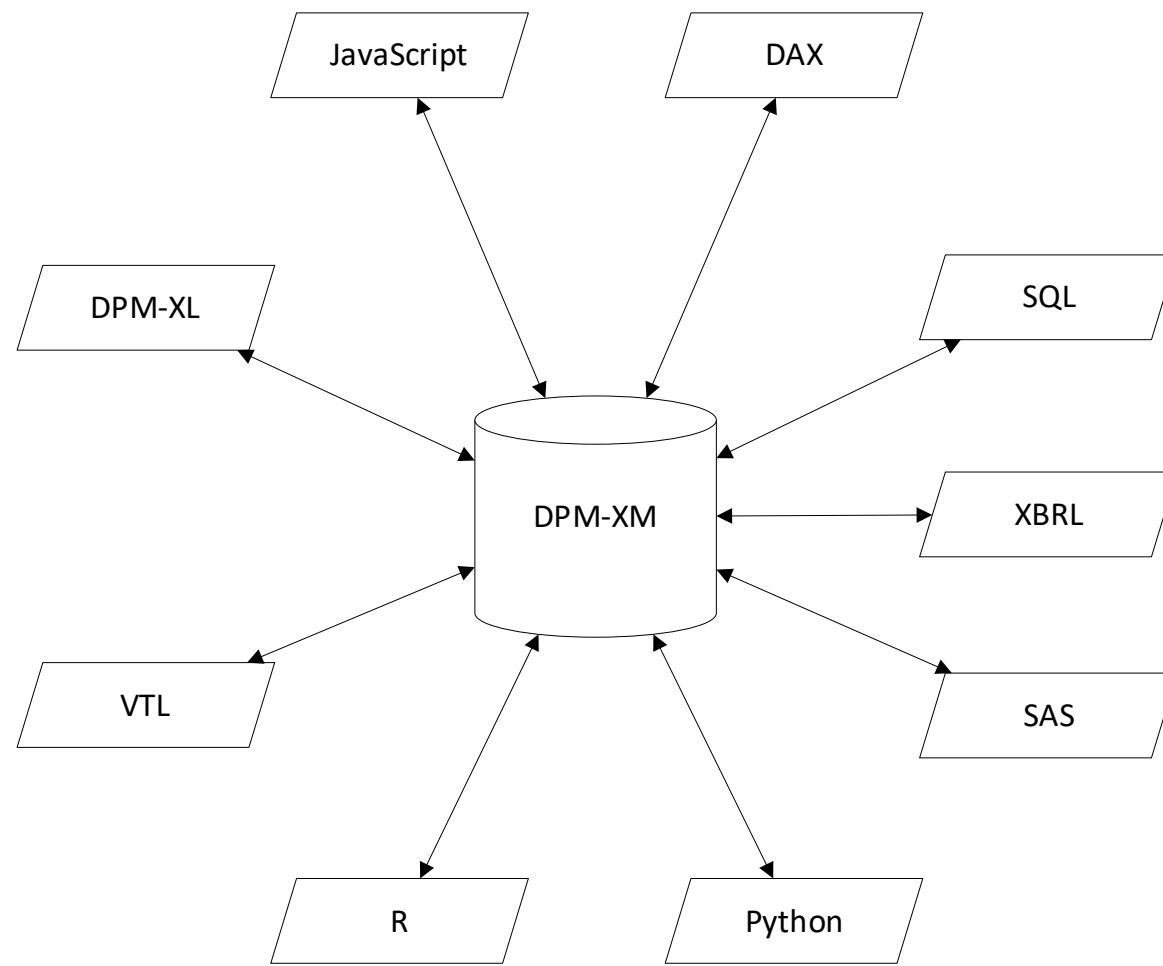
Logical expression

$$F = E + IF((C-D) > (B^2+2A), 10, B+A)$$

**Abstract syntax tree**

Metamodel

❖ The current DPM database includes, since the first release on 2013, the validations rules as expressed by the business experts, and also the translation of these expressions as metadata mapping the rules to other core DPM concepts, from which the XBRL validations are generated via an automated process.

❖ The scope of the DPM Refit initiative encompassed the entirety of the DPM metamodel, including the part relating to validation rules, for which a new approach was proposed for the representation of expressions, in a standardised form of Abstract Syntax Trees, as previously mentioned, from which the XBRL validations will be automatically generated.

❖ Aside from the metamodel improvements and technical optimisation, the high-level process of producing the taxonomies and validation rules will be fundamentally the same, and from the stakeholders' perspective, the resulting products will be no different from the usual ones, ensuring continuity and compatibility, and not causing disruption to solutions already in use.
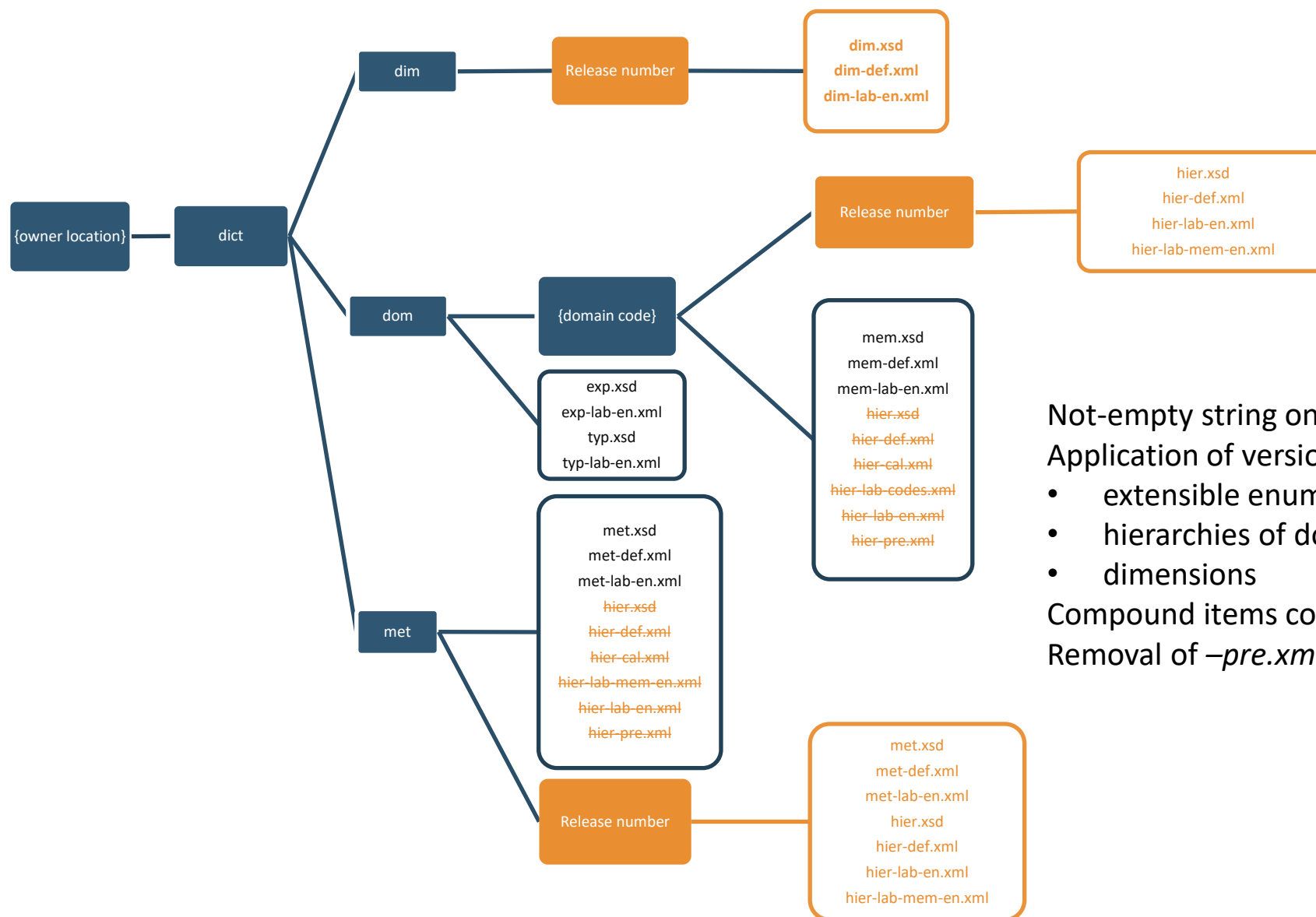
Evolution of regulatory
data exchange

❖ In late 2019 the EBA started the Task Force for Evolving the Reporting Format (TFERF), in close cooperation with EIOPA and the banking Competent Authorities, and the active collaboration of XBRL International, to address the problems of high complexity and poor performance of XBRL-based reporting.

❖ Three areas of concern were identified by the TFERF:

  ➢ The XBRL reporting format is extremely heavy and unnecessarily verbose.

  ➢ The XBRL validation rules are very complicated, and existing validation engines cannot cope with large report files.

  ➢ The XBRL taxonomies are complex and difficult to maintain, providing only snapshots of the reporting framework.

❖ During 2020 the TFERF concluded that the XBRL-CSV reporting format, with minor fine-tuning, was a good alternative to the traditional XBRL-XML format.

❖ In 2022 the TFERF addressed the validation rules problem, with the conclusion that new technical specifications for the validation of XBRL-CSV reports was needed and should be developed under the coordination of XBRL International.

❖ The problem of the XBRL taxonomy complexity has not yet been addressed.

1.0:
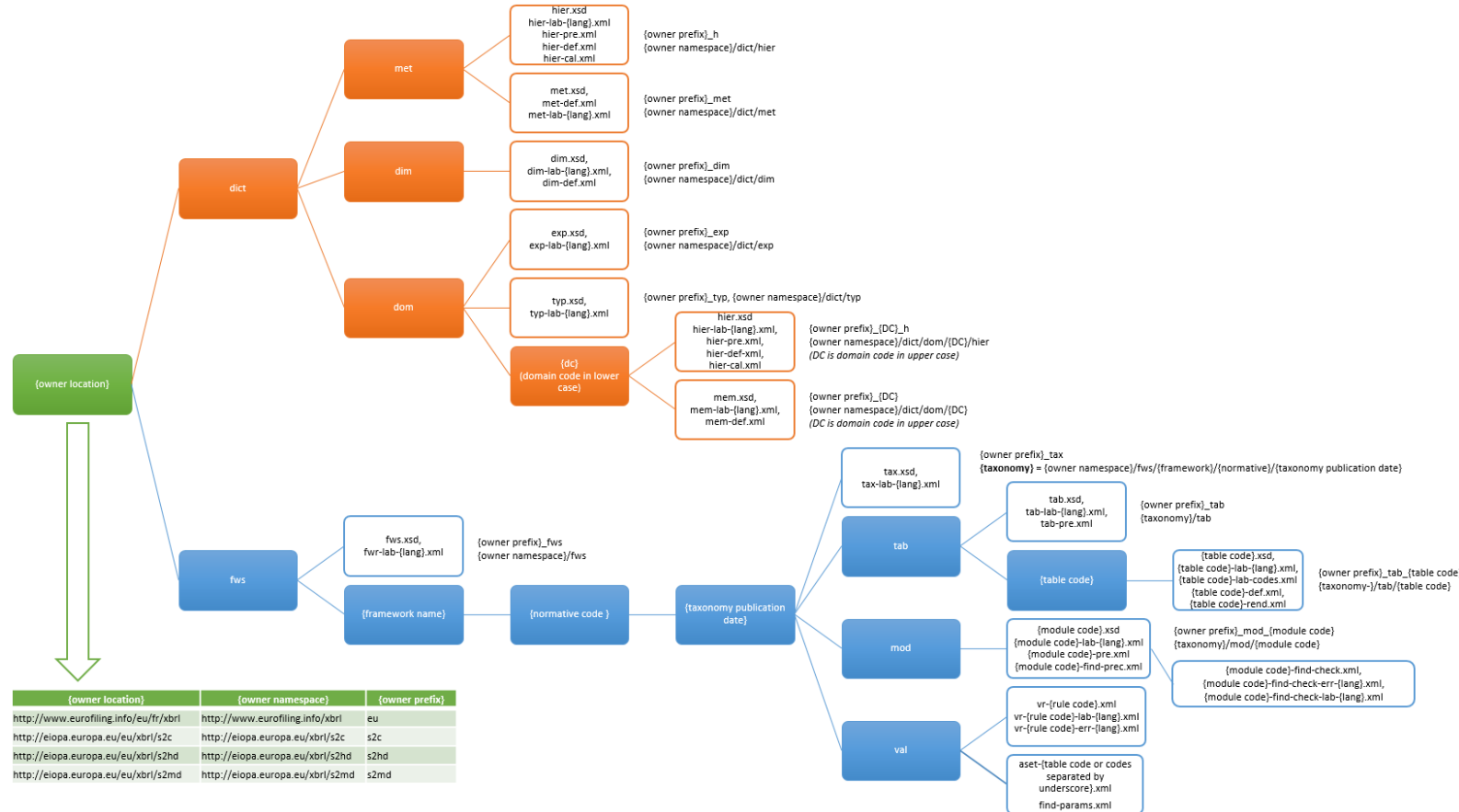
2.0 - Why?

❖ to support DPM Refit (historization, new functionalities, etc)

❖ to simplify and improve (first review ever)

❖ to align EBA and EIOPA taxonomy architectures

dict — dim — Release number — **dim.xsd** / **dim-def.xml** / **dim-lab-en.xml**

dict — dom — {domain code} — Release number — hier.xsd / hier-def.xml / hier-lab-en.xml / hier-lab-mem-en.xml

{owner location} — dict

{domain code} — mem.xsd / mem-def.xml / mem-lab-en.xml / hier.xsd / hier-def.xml / hier-cal.xml / hier-lab-codes.xml / hier-lab-en.xml / hier-pre.xml

dom — exp.xsd / exp-lab-en.xml / typ.xsd / typ-lab-en.xml

met — met.xsd / met-def.xml / met-lab-en.xml / hier.xsd / hier-def.xml / hier-cal.xml / hier-lab-mem-en.xml / hier-lab-en.xml / hier-pre.xml

met — Release number — met.xsd / met-def.xml / met-lab-en.xml / hier.xsd / hier-def.xml / hier-lab-en.xml / hier-lab-mem-en.xml

Not-empty string on string elements and string typed domains
Application of versioning on:
- extensible enumeration metrics
- hierarchies of domain members
- dimensions

Compound items composition
Removal of –*pre.xml* files (duplicate with –*def.xml* files)u

1. Removal of *tax.xsd*, *tax-lab.xml* files and the "normative" folder (not useful or even confusing)
2. Use release number instead publication date in the release folder name
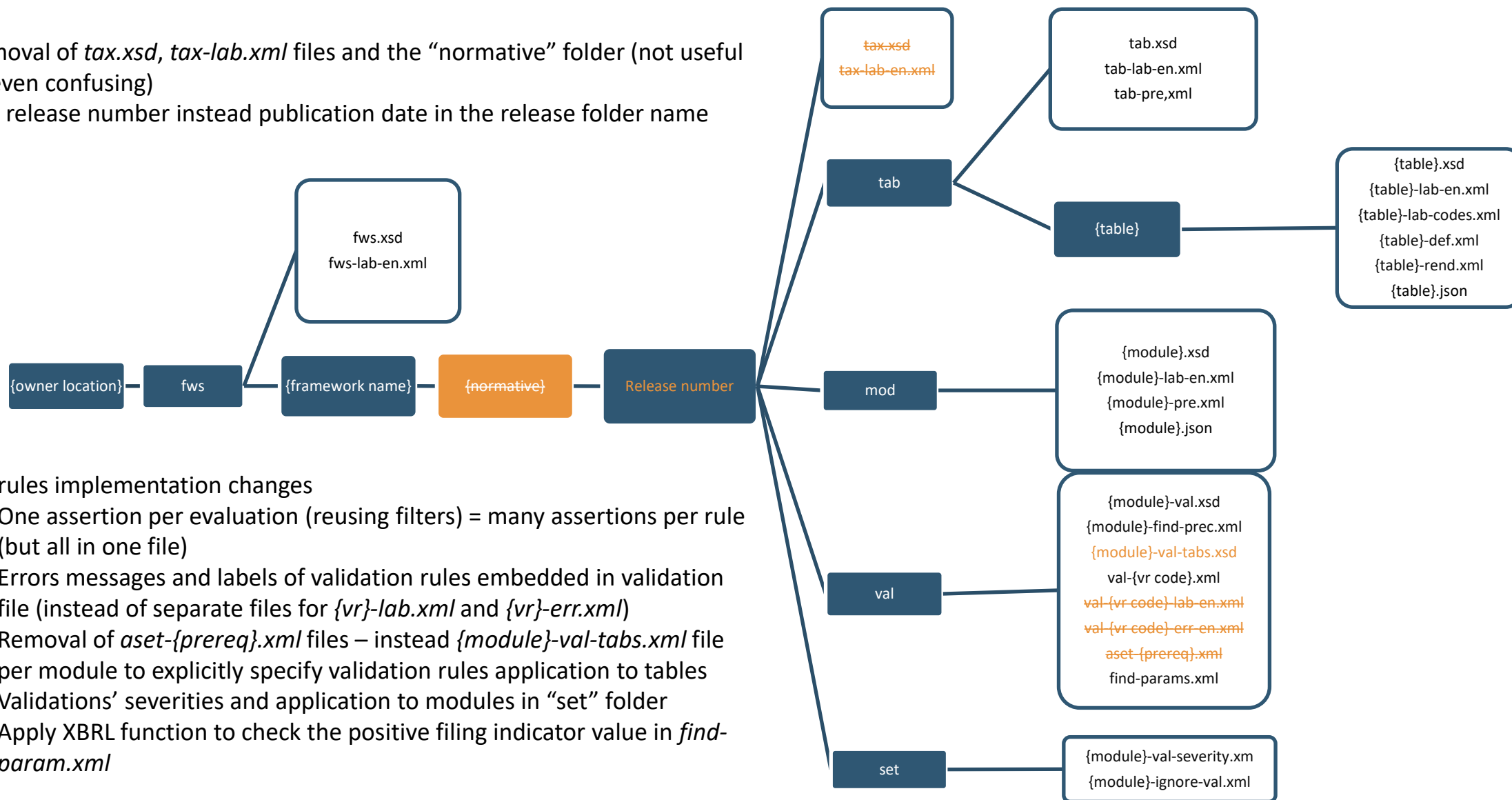
Validation rules implementation changes
- a. One assertion per evaluation (reusing filters) = many assertions per rule (but all in one file)
- b. Errors messages and labels of validation rules embedded in validation file (instead of separate files for *{vr}-lab.xml* and *{vr}-err.xml*)
- c. Removal of *aset-{prereq}.xml* files – instead *{module}-val-tabs.xml* file per module to explicitly specify validation rules application to tables
- d. Validations' severities and application to modules in "set" folder
- e. Apply XBRL function to check the positive filing indicator value in *find-param.xml*

tax.xsd
tax-lab-en.xml

tab.xsd
tab-lab-en.xml
tab-pre,xml

fws.xsd
fws-lab-en.xml

{table}.xsd
{table}-lab-en.xml
{table}-lab-codes.xml
{table}-def.xml
{table}-rend.xml
{table}.json

{owner location} — fws — {framework name} — {normative} — Release number

tab

{table}

mod

{module}.xsd
{module}-lab-en.xml
{module}-pre.xml
{module}.json

val

{module}-val.xsd
{module}-find-prec.xml
{module}-val-tabs.xsd
val-{vr code}.xml
val-{vr code}-lab-en.xml
val-{vr code}-err-en.xml
aset-{prereq}.xml
find-params.xml

set

{module}-val-severity.xm
{module}-ignore-val.xml

- ❑ Reporting data points are commonly identified by enumerating their dimensional properties, as in XBRL taxonomies, or by referring to their template coordinates, as used in the business validations language.

  While these methods may work within each taxonomy release (i.e. for a snapshot version of the reporting framework), they cannot handle the evolution of a datapoint between releases, making them unsuitable for time series analysis.

- ❑ With regard to the dimensional properties, modelling of templates is often corrected or enhanced in new versions, and therefore the dimensional signature of the same datapoint changes over time.

  As for template cell coordinates (row, column, sheet), they can simply change due to template redraw and still refer to the same data point or, conversely, the same cell might be changed to host a different datapoint.

- ❑ In view of the above limitations, the EBA chose to use invariant Data Point IDs as identifiers of fact values reported with XBRL-CSV format.

  It should be noted that the Data Point IDs are added to the JSON metadata file that extends the Taxonomy, making it extremely simple to map the these IDs both to the dimensional properties and to the template coordinates.
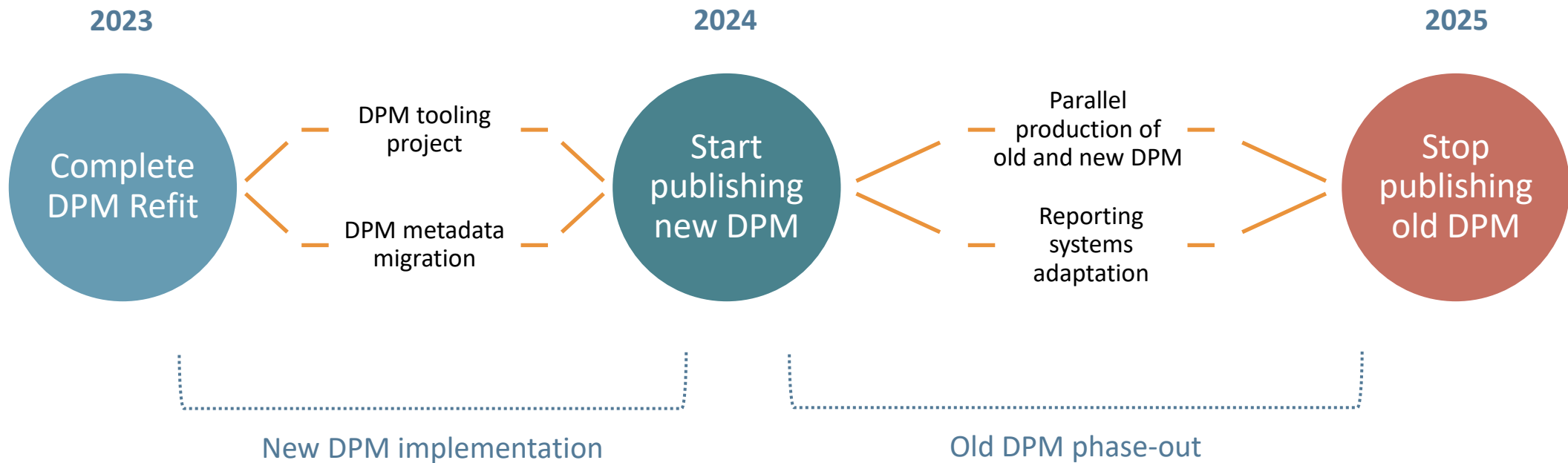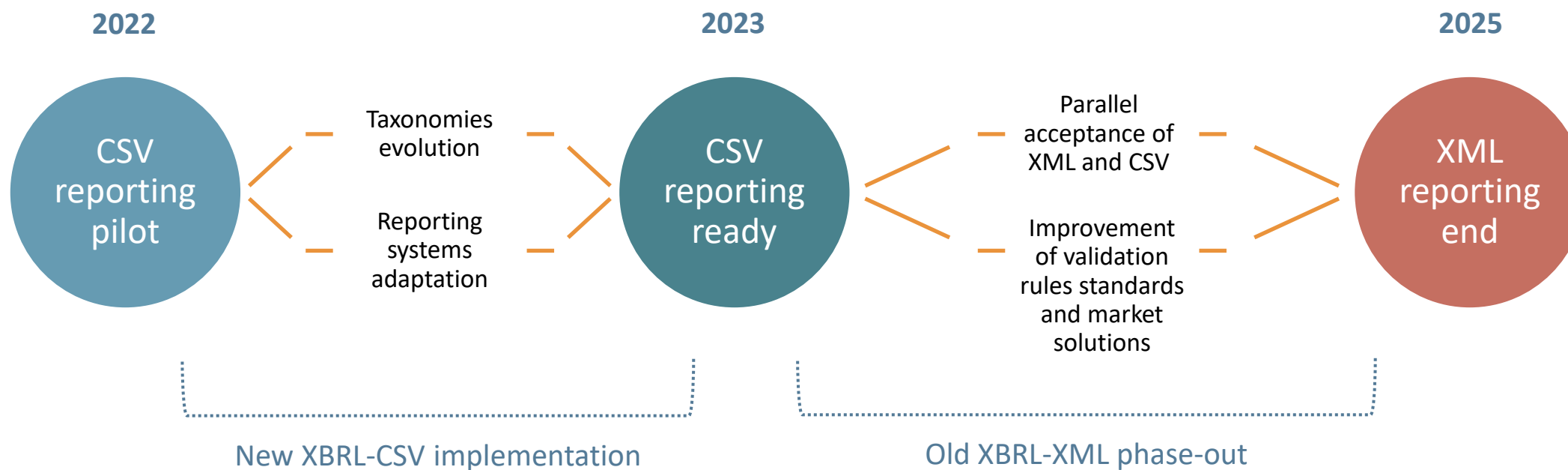
❑ XBRL-CSV format options include key-value pairs and tabular structures.

❑ Regulatory requirements are currently expressed through 'closed' and 'open' templates, for aggregated or more granular data respectively, the former being defined by a fixed two-dimensional grid with predefined rows and columns, and the latter typically represented as a flat or normalized table with an undetermined number of rows and in which one or more columns define the key identifier of each row.

❑ In the case of 'Closed' templates, all reported values can be identified simply by referring to the table cell, or data point ID, to which it refers, so it is naturally appropriate and simpler to use the key-value pair format for data collection.

❑ For 'Open' templates, tabular structures may sometimes be advantageous for performance optimisation, but this format can be easily obtained by simple pivoting of the key-value pair format.

Moreover, the tabular format is limited in its ability to support some relevant requirements, such as the indication of different reporting units, or precision, or comments, per fact value.

❑ In view of the constraints of the tabular structures, and because no significant disadvantage was identified on the key-value pair structures, the EBA has chosen to align the whole reporting specification and to adopt one single format for CSV-based reporting.

Transition phase
towards DPM 2.0 Refit and xBRL CSV

2022

CSV reporting pilot

Taxonomies evolution

Reporting systems adaptation

2023

CSV reporting ready

Parallel acceptance of XML and CSV

Improvement of validation rules standards and market solutions

2025

XML reporting end

New XBRL-CSV implementation

Old XBRL-XML phase-out

2025

2026

2027

???

2.9
Pilot
CSV & DPM Refit reporting

PoC

Reporting systems adaptation

2.10
DPM Refit
CSV & XML reporting

EIOPA's Software change
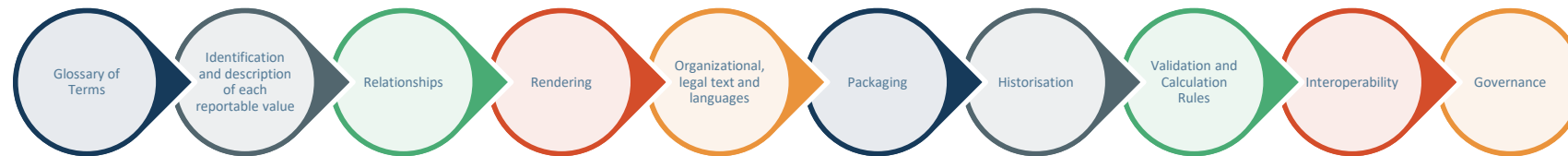
DPM Studio

xBRL-XML phase out

See full timeline in EIOPA DPM and xBRL webpage

DPM standard

Published on 13/06/2023

❑   Documentation of the **DPM 2.0 Refit metamodel**

❑   Documentation of the **validation and transformation language**

❑   **Supporting documentation** with presentations, diagrams and database models

❑   An updated EBA and EIOPA common **xBRL taxonomy architecture**

Glossary of Terms → Identification and description of each reportable value → Relationships → Rendering → Organizational, legal text and languages → Packaging → Historisation → Validation and Calculation Rules → Interoperability → Governance

Interoperability API

❑ Goal: to enable meta-exchange among DPM Refit repositories

❑ Decentralized approach

❑ Based on open standards (WS/REST)

❑ First version read only

❑ Based on DPM concepts' IDs and GUIDs to enable cross-domain interoperability

Governance

❑ Clear and transparent decision-making process for the maintenance and evolution of the DPM Standard

❑ Focused on the scope of DPM methodology (syntactical integration)

❑ Focused on operational aspects

❑ Being discussed among EBA, ECB and EIOPA

❑ Open to technical contribution of other competent authorities and stakeholders

❖ EIOPA and EBA have already started the transition process from the XBRL-XML reporting format to XBRL-CSV, to be completed by the end of 2025.

  (Although, in the case of EIOPA, XBRL-CSV is still not envisaged as mandatory)

❖ The contribution of the XBRL community in this process will be greatly appreciated, namely with regard to the definition of new standards for the validation rules for the XBRL-CSV format, which is undoubtedly of the utmost importance for many stakeholders, in particular the reporting institutions that depend on reliable market solutions.

Thank you for your attention!