



# POTENTIAL DATA POINT MODEL ENHANCEMENT

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# DATA POINT MODEL – THE PRESENT

- DPM Origins
- DPM Implementations worldwide
  - EU
  - Other than EU
- DPM strengths and weaknesses

# DATA POINT MODEL – THE FUTURE

- Technical representations – OIM
- Implementations (Aggregated data -> Granular data)
- Domain coverage (Financial, ...?)
- Collaborative development
- Analytical requirements

# PROPOSED DPM ENHANCEMENTS

1. Adding missing link between enumeration metrics and dimensions
2. More specific identification of default members applicable in the model
3. Addressing modelling and aggregation of complex multi-dimensional business terms by introduction of 'DPM object'
4. Thesaurus and dictionary environment supported by the DPM



Complexity



# DIMENSIONS LINKED TO THE ENUMERATIONS

# 1. DIMENSIONS LINKED TO THE ENUMERATIONS

In current taxonomies, the enumeration metric (usually used in open tables e.g. line by line position/transaction reporting) lacks a connection to a dimension, which makes it more difficult to navigate to more granular data

	ISIN	Instrument	Book value
	0010	0020	0020
0010			

Metric

(ei100) Instrument type [ei:DOM:DOM2]

(mi01) Carrying amount [mi]

(ISIN:ID) ISIN Code (ID:) <Key value>

Hierarchy name	Applicable dimensions
DOM2: Asset type hierarchy for enumeration	N/A
Debt securities	
Listed equities	

While closed tables (e.g. balance sheet) uses on their axes categorization in form of domain members, which also contain dimensions as context giving option.

	Book value	Fair value
Debt securities		
Listed equities		

Metric

(mi01) Carrying amount [mi]

(mi02) Fair value [mi]

(TA:DOM) Type of asset

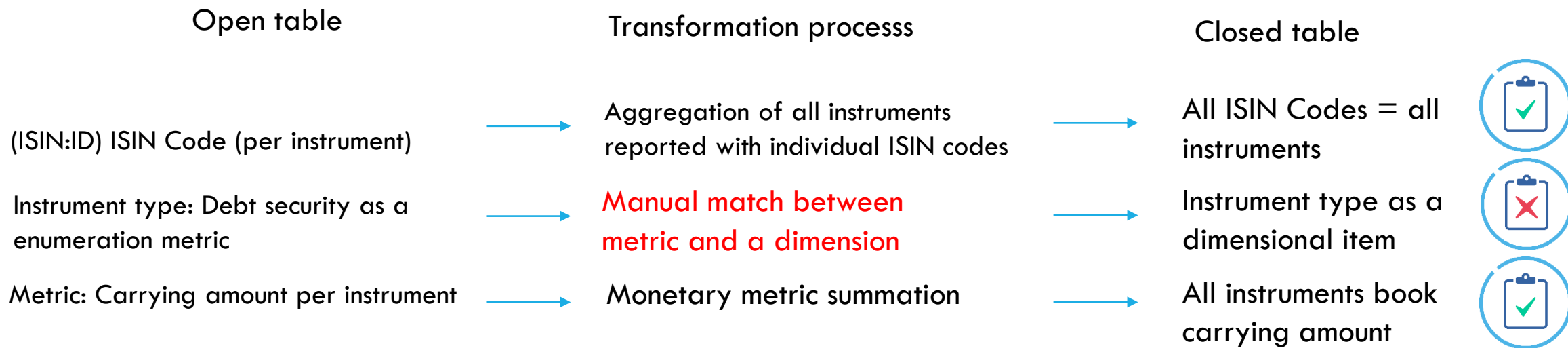
(DOM\_1) Debt securities

(DOM\_2) Listed equities

Dimension

Hierarchy name	Applicable dimensions
DOM1: Asset type hierarchy	TA: Type of assets TL: Type of collateral
Total	
Cash	
Debt securities	
Listed equities	

# 1. DIMENSIONS LINKED TO THE ENUMERATIONS

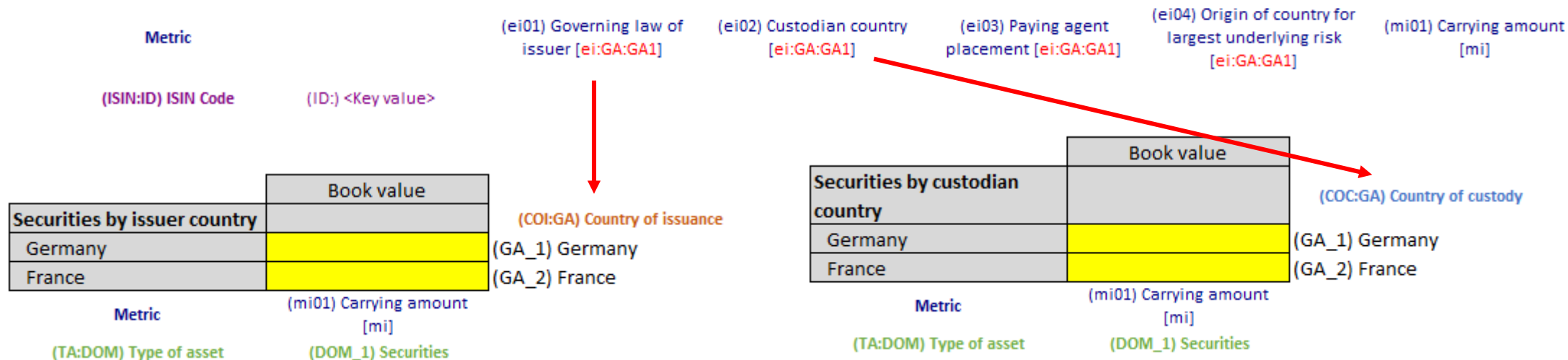


- Requires manual matching by business users not by automated logical connection stemming from meta-model.
- Labels in enumeration metrics needs to be precisely described to allow data base users to match the data between open and closed tables.

# 1. DIMENSIONS LINKED TO THE ENUMERATIONS

The problem might get much more complicated when we use open tables with more than one enumeration referring to same members in the same domains.

	ISIN	Governing law of issuer	Custodian country	Paying agent placement	Origin of country for largest underlying risk	Book value
	0010	0020	0030	0040	0050	0060
0010						





# 1. DIMENSIONS LINKED TO THE ENUMERATIONS

Solvency II example: S06.02 vs S.02.01 position aggregation supported by validation.

**S.02.01.01.01**  
Balance sheet

		Solvency II value			
		C0010			
<b>Assets</b>					
Bonds	R0130		BL/Neither unit-linked nor index-linked	Metric: Monetary BC/Assets	AS/Bonds
Corporate Bonds	R0150		BL/Neither unit-linked nor index-linked	Metric: Monetary BC/Assets	AS/Corporate Bonds

VG/Solvency II

BL:LB Line of business [general]

**S.06.02.01**  
List of assets

Asset ID Code and Type of code	Asset held in unit linked and index linked contracts	Total Solvency II amount	CIC
C0040	C0090	C0170	C0290

\*foreign key to S.06.02.01.02\*"mandatory" UI: URI

Metric: Held in unit linked and index linked funds

Metric: Monetary VG/Solvency II

Metric: String TS/CIC code

No link to dimension

Validation BV368 (simplified version) =  
if {S.06.02, c0290} like '##2#' and  
{S.06.02, c0090}=[s2c\_LB:x91] then  
{S.02.01, r0150,c0010}=sum({S.06.02,  
c0170,(sNNN)})



# DEFAULTS ATTACHED TO THE DIMENSIONS

## 2. DEFAULTS ATTACHED TO THE DIMENSIONS

Default members - are such domain members that are „per default” chosen as a modeling categorizations for particular fact, if business user did not specify any other domain member by manual modeling process.

In already established taxonomies, such concepts are attached only to taxonomy domains (which are conceptual groups of definitions, that share similar semantic meaning) rather than dimensions (contextual reference) attached to hierarchies (which in fact are sub-domains)

## 2. DEFAULTS ATTACHED TO THE DIMENSIONS

Example: If we have a categorization of balance sheet data point, with value of debt securities „**after economic shock**” and „**before economic shock**” modeled as dimensional characteristic in „**economic shock scenario**” dimension, it can be said that per default all values in balance sheet, or even whole model are from business perspective „before economic shock”.

In the end, placing as default member „**before economic shock**” for „**economic shock scenario**” dimension would create a complete logical model, without having to add such categorization on every data point in model to differentiate it from a couple of data points with values „after economic shock”.

## 2. DEFAULTS ATTACHED TO THE DIMENSIONS

Example of domain that uses default members other than Total/NA (or Total and NA as separate and only concepts).

Framework	Domain	Default member
SII	Treatment of risk mitigation	x0 - Before risk mitigation
SII	Article 112 and 167	x0 - No

Example of domain that could be artificially taken out from „mother domain” only to properly represent the default member for DPM model.

Framework	Domain	Default member
EBA banking	Currency	Not applicable/ All currencies
EBA banking	Currency conversion approach	Not applicable / Expressed in (converted to) reporting currency

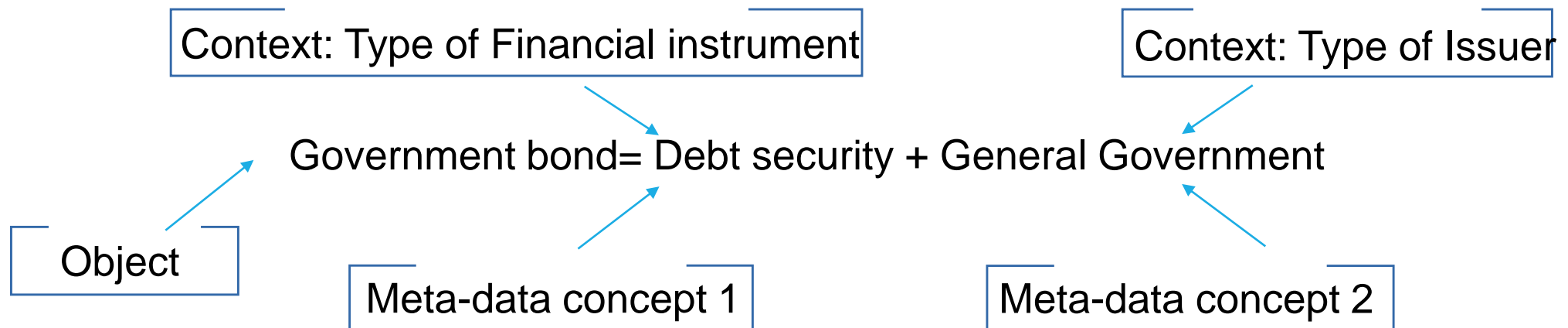


# NEW DPM ARTEFACT – ‚OBJECT’

# 3. NEW DPM ARTEFACT - „OBJECT”

Proposed new artefact - an „object” in a DPM environment is a particular data classification or meta-data item, that is characterized by more than one characteristics (with appropriate contexts), which on it's own (these characteristic) are a separate concepts, with own meaning and linguistical use in particular domain of interest.

# 3. NEW DPM ARTEFACT - „OBJECT”



Government bond is such a debt security that is issued by general government



# 3. NEW DPM ARTEFACT - „OBJECT”

There are two general cases for objects in the DPM:

- Cases where the definition of a given item consists of several dimensional attributes from the DPM perspective (e.g. „Listed equities). These are usually generally recognisable business definitions.
- Cases where an item is an aggregation of a few DPM objects, where it would be difficult to correctly represent the complex aggregation using one set of dimensional characteristics (e.g. aggregation of listed equities and government bonds)

# 3. NEW DPM ARTEFACT - „OBJECT”

	ISIN	Instrument type	Issuer sector	Maturity	Traded on market or OTC
	0010	0020	0030	0040	0050
0010					

Metric (ISIN:ID) ISIN Code (ID:) <Key value>

(ei01) Instrument type [XXX] (ei02) Sector issuing security [XXX] (ei03) Original maturity [XX] (ei04) Type of market security is traded on [XX]

Equity Instruments	General governemnt	x =< 1yr	Regulated market
Debt securities	Financial corporations	1yr =< 10yr	OTC
	Non-financial corporation:	10yr >	

	ISIN	Instrument type
	0010	0020
0010		

Metric (ISIN:ID) ISIN Code (ID:) <Key value>

(ei01) Instrument type [XXX]

T-bills
Listed equity

# 3. NEW DPM ARTEFACT - „OBJECT”

Hierarchy	Object componen dimensions	Code	Sign	Weight	Owner	Creation date	Validity date	Last modified date
T-bills		OB_1	=		BR-AG	01.01.2019		
Debt securities	(AST:AS) Asset type	AS:x5		&				
General government	(CPY:CP) Counterparty issuer	CP:x450		&				
Maturity	(OMA:TI) Original maturity	TI:x76		&				

# 3. NEW DPM ARTEFACT - „OBJECT”

Purpose for defining the ‚DPM’objects’:

- New possibilities for multi dimensional analysis of data bases, letting to grasp data from different angles (e.g. by filtering data by general government to see potential financial input interesting for analysis from that angle, can be done by reference to one characteristics „general government” with multiple contexts, not by having to know that concept sovereign bond has some business connection to general government.
- Possibility to fully represent the model using the DPM characteristics without a need to ‚patch’ the model with artificially created items
- Letting business users and business environment use their own language, without loosing the ability to properly model the data with multi-dimensional approach for better data management.



# THESAURUS AND DICTIONARY ENVIRONMENT SUPPORTED BY DPM

# 4. THESAURUS AND DICTIONARY ENVIRONMENT SUPPORTED BY DPM

Proposed item	Item description
Concept name	Listed shares
Synonyms	Quoted shares; Listed equities; Quoted stocks; etc, Tradable shares; etc...
Language synonyms	PL: Rynkowe akcje zwykłe; DE: Börsennotierte Aktien; etc...
Taxonomy code	OBJ:x5
Concept definition	listed shares are <b>equity securities listed on an exchange</b> . Such an <b>exchange may be a recognized stock exchange or any other form of secondary market</b> . Listed shares are also referred to as quoted shares. The existence of quoted prices of shares listed on an exchange means that current market prices are usually readily available.
Definition reference	European system of accounts - ESA 2010 (F.511) ( <a href="#">link</a> )
Broader term	Equity instrument
Narrower term	-
Placement in hierarchy	<a href="#">(link to DPM hierarchy)</a>
Framework	EBA - (FINREP, COREP; etc...); ECB – SHS ; EIOPA - Solvency II