

# **DATA POINT MODEL VS. MULTIDIMENSIONAL DATA MODEL.**

**CEN WS XBRL Plenary Session. Dublin, Friday, April 19<sup>th</sup>, 2013.**

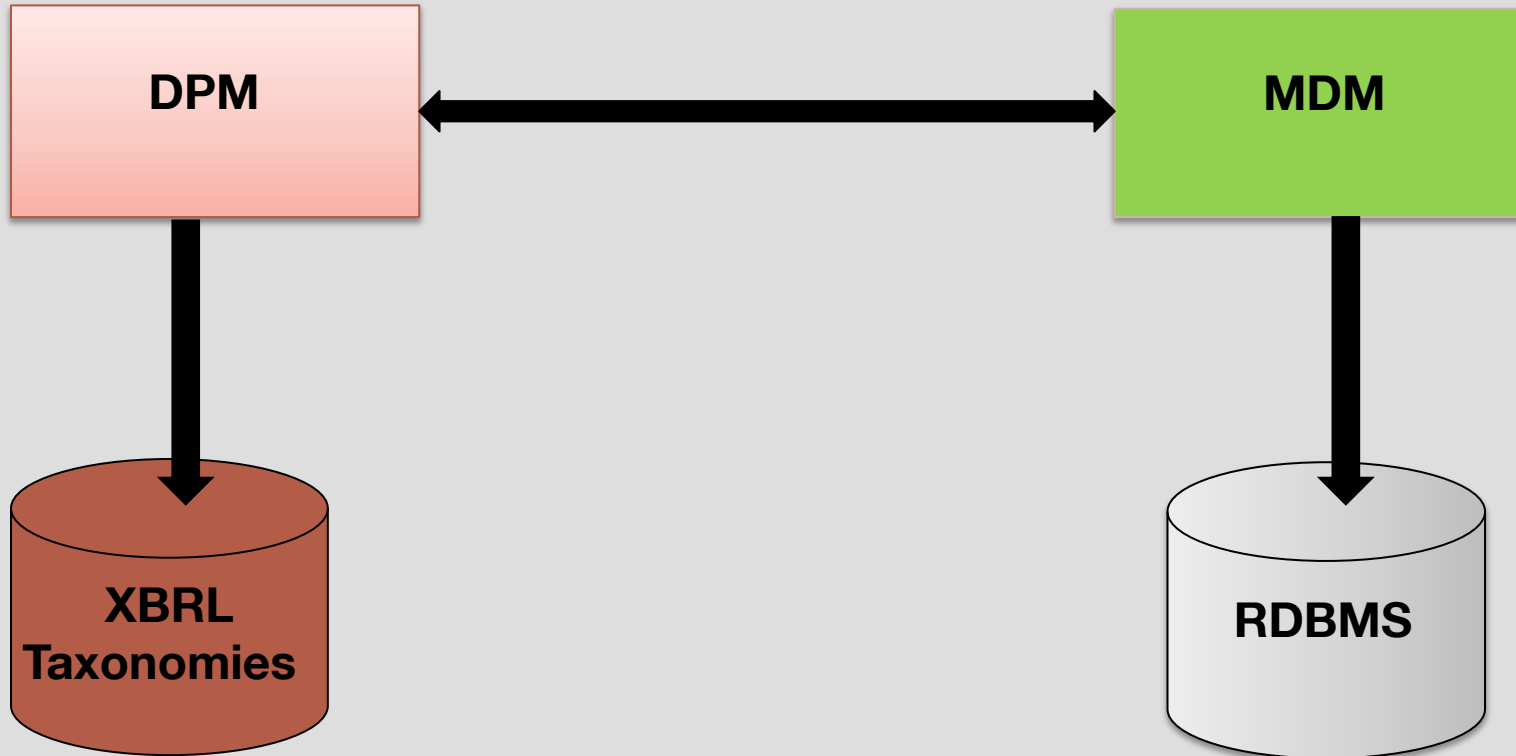
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Madrid, April 19th, 2013



- **Introduction.**
- **DPM vs. MDM.**
- **Conclusions.**

# INTRODUCTION I



**DMP vs. MDM**

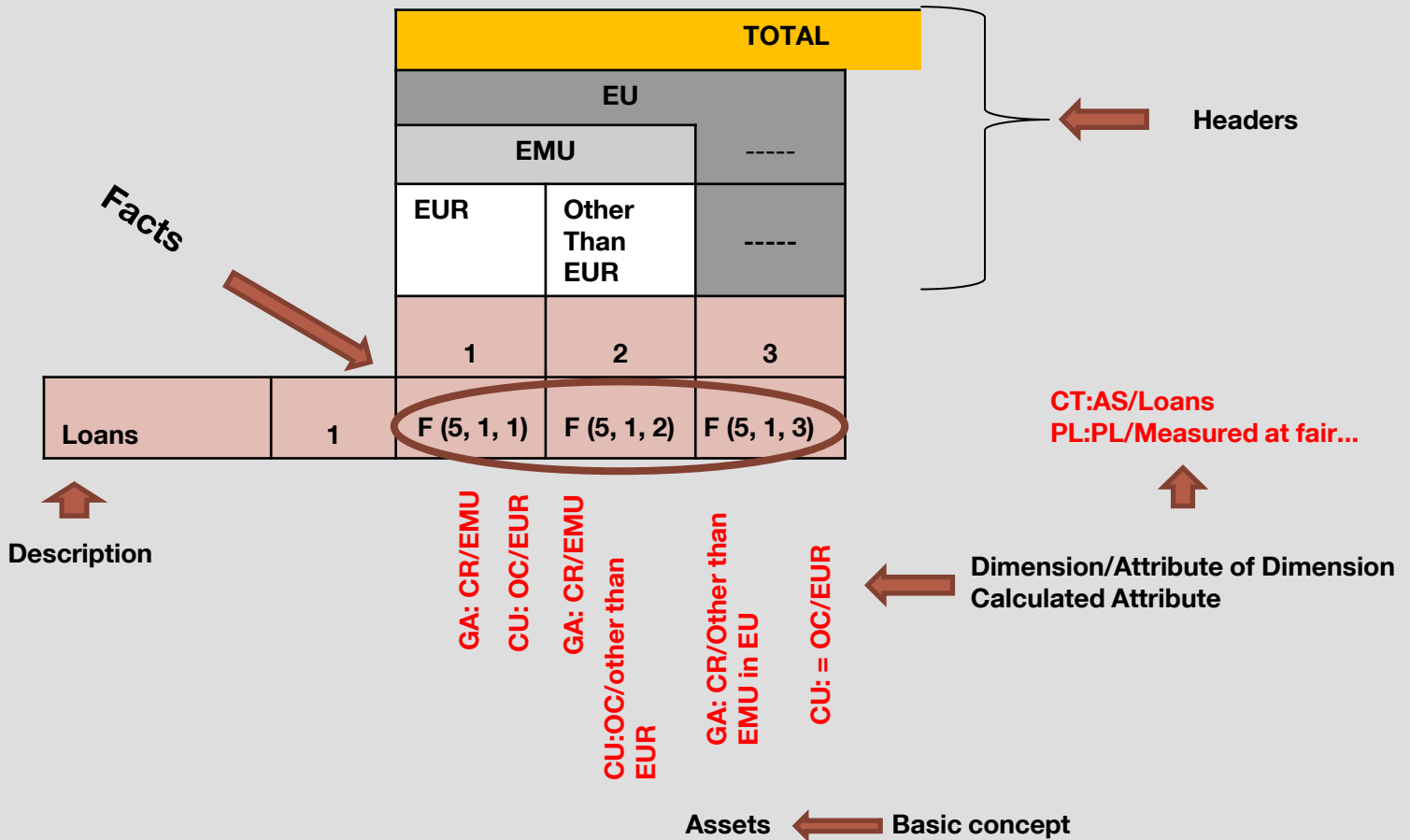
# INTRODUCTION II



		TOTAL					
		EU				Other than EU	
		EMU					
		EUR					
		1	2	----	5	6	7
Loans	1	F(5, 1, 1)	F(5, 1, 2)	----	F(5, 1, 5)	F(5,1,6)	F(5, 1, 7)
of which: Non-Financial corporations	2	F(5, 2, 1)	F(5, 2, 2)	----	F(5, 2, 5)	F(5, 2, 6)	F(5, 2, 7)
of which: Households	3	F(5, 3, 1)	F(5, 3, 2)	----	F(5, 3, 5)	F(5, 3, 6)	F(5, 3, 7)
Debt securities held	4	F(5, 4, 1)	F(5, 4, 2)	----	F(5, 4, 5)	F(5, 4, 6)	F(5, 3, 7)
Equity instruments held	5	F(5, 5, 1)	F(5, 5, 2)	----	F(5, 5, 5)	F(5, 5, 6)	F(5, 5, 7)
Derivatives	6	F(5, 6, 1)	F(5, 6, 2)	----	F(5, 6, 5)	F(5, 6, 6)	F(5, 6, 7)
Equity and debt instruments	7	XXXX	XXXXX	----	XXXX	XXXX	F(5, 7, 7)
Other assets than equity	8	XXXX	XXXXX	----	XXXX	XXXX	F(5, 8, 7)
Total assets	9	F(5, 9, 1)	F(5, 9, 2)	----	F(5, 9, 5)	F(5, 9, 6)	F(5, 9, 7)

**“Assets by counterparty residence and currency”, Template 5 of FINREP 2012**

# INTRODUCTION III



Sample of the template number 5 of FINREP 2012

## DPM vs. MDM I



- **Element of the dictionary → Concept**
  - Concepts → period of time, type
- **Domain → Domain.**
- **Dimension.**
  - Dimension → Dimension.
  - Dimension → dimension attribute (domain-member).
  - Calculated attribute (domain-member).

## DPM vs MDM II



- **Primary Item → Basic concept.**
  - Type of period of time.
  - Data type.
    - If data type is monetary, then Balance.
- **Base Dimension.**
  - Base Dimension → Dimension → Domain.
- **Each taxonomy has a Base Dimension.**

## DPM vs MDM III




- **Family** → **Group of dimensions.**
  - Dimension.
  - Group of dimensions → Domains.



## XBRL vs. MDM IV

- **Member by default → concept by default.**
  - Domain → Concept by default.
  - The dimensions inherit the concept by default.

- **Concept by default** 
  - Attribute of dimension.**
  - Calculated Attribute.**

## DPM vs. MDM V

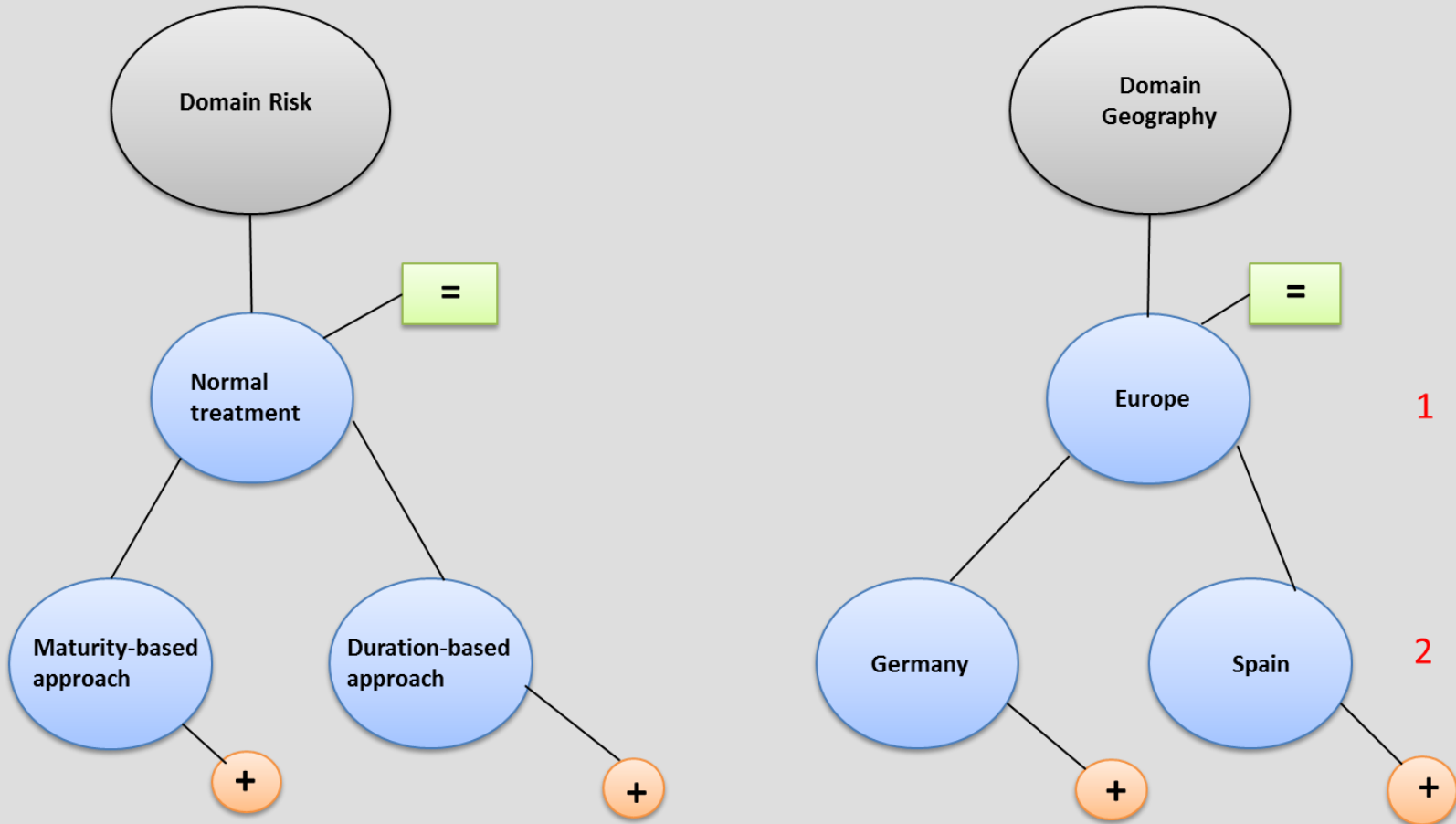


- **DP → Fact.**
  - Attribute of Dimension/Dimension.
  - Primary ítem.
  - Calculated attribute.



- **Hierarchies.**
  - Domains: Concepts.
  - Concepts → father, childrens.
  - Father Concept → validation children.
  - Children concept → operation (+/-).
  - Dimensions → Inheritance of domains.

# DPM vs. MDM VII



Hierarchy versus aggregation.



**Fact Table**

Number of cell	Value	Basic concept	SDo/Concept	SDo/Concept
1	10	Assets	Risk/Maturity-based approach	Geography/Germany
2	20	Assets	Risk/Duration-based approach	Geography/Germany
3	30	Assets	Risk/Normal treatment	Geography/Germany
-----	-----	-----	-----	-----
100	50	Assets	Risk/Maturity-based approach	Geography/Spain
105	50	Asstes	Risk/Normal treatment	Geography/Spain
-----	-----	-----	-----	-----

Cell(3) = Cell(1) + Cell(2), and Cell(105) = Cell(100)

**Hierarchy versus aggregation in the fact table.**



- **Type of Dimensions.**
  - **Explicit dimensions.**
    - Dimensions.
    - Attributes of dimensions.
    - Calculated attributes.
  - **Implicit dimensions.**
    - Dimensions.
    - Attributes of dimensions.
    - Domains without hierarchy.

## DPM vs. MDM X



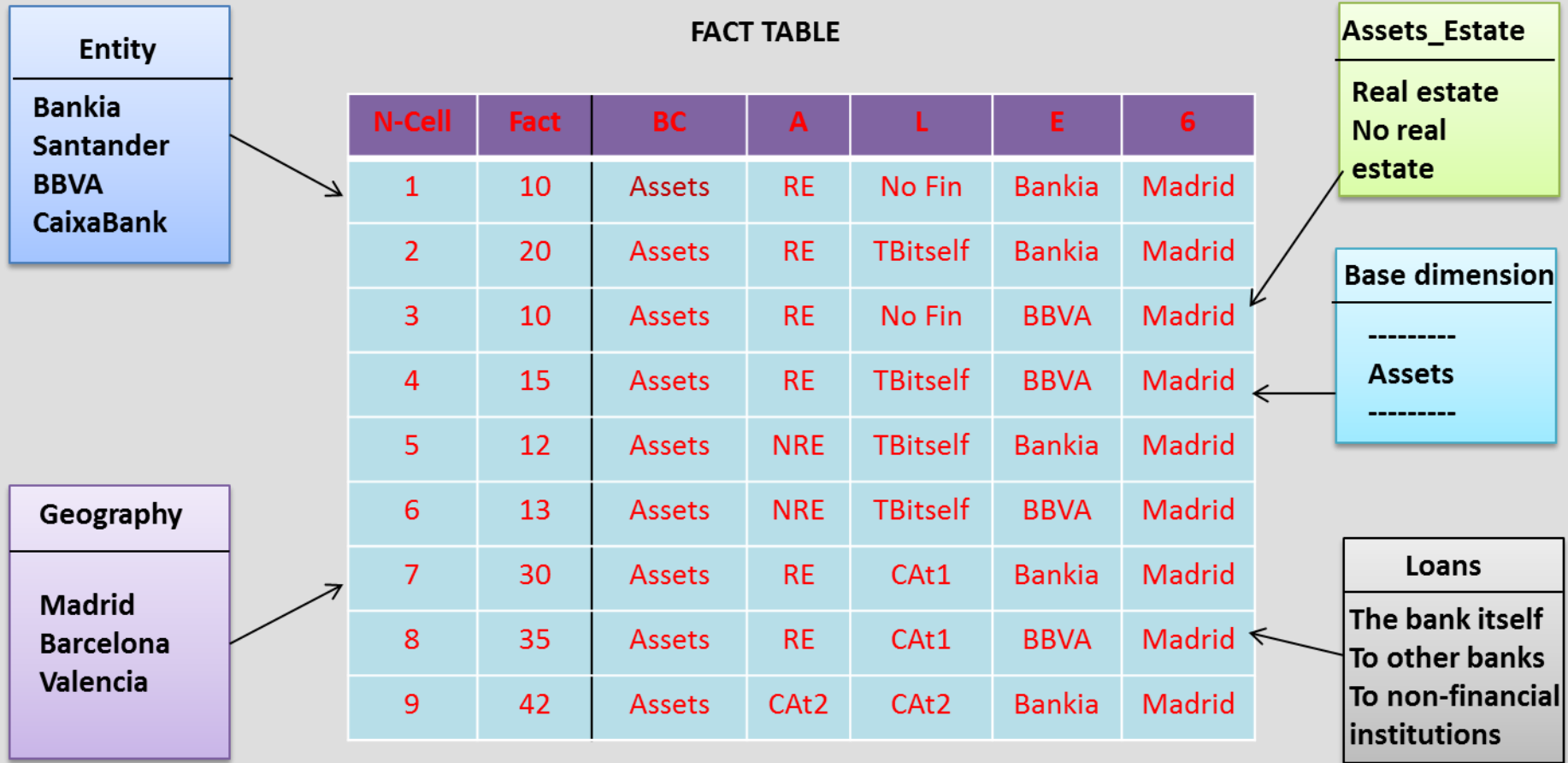
- **References.**
- **Tuples (dimensions).**
- **Facts:**
  - Bc (primary ítems) + (attribute of dimensions, dimensions).

## DPM vs. MDM XI

- **Hypercubes → Constraints.**
  - Hypercube allowed.
  - Hypercube forbidden.



# DPM vs. MDM XII



**Example of fact table with calculated attributes**



- **Allowed:**

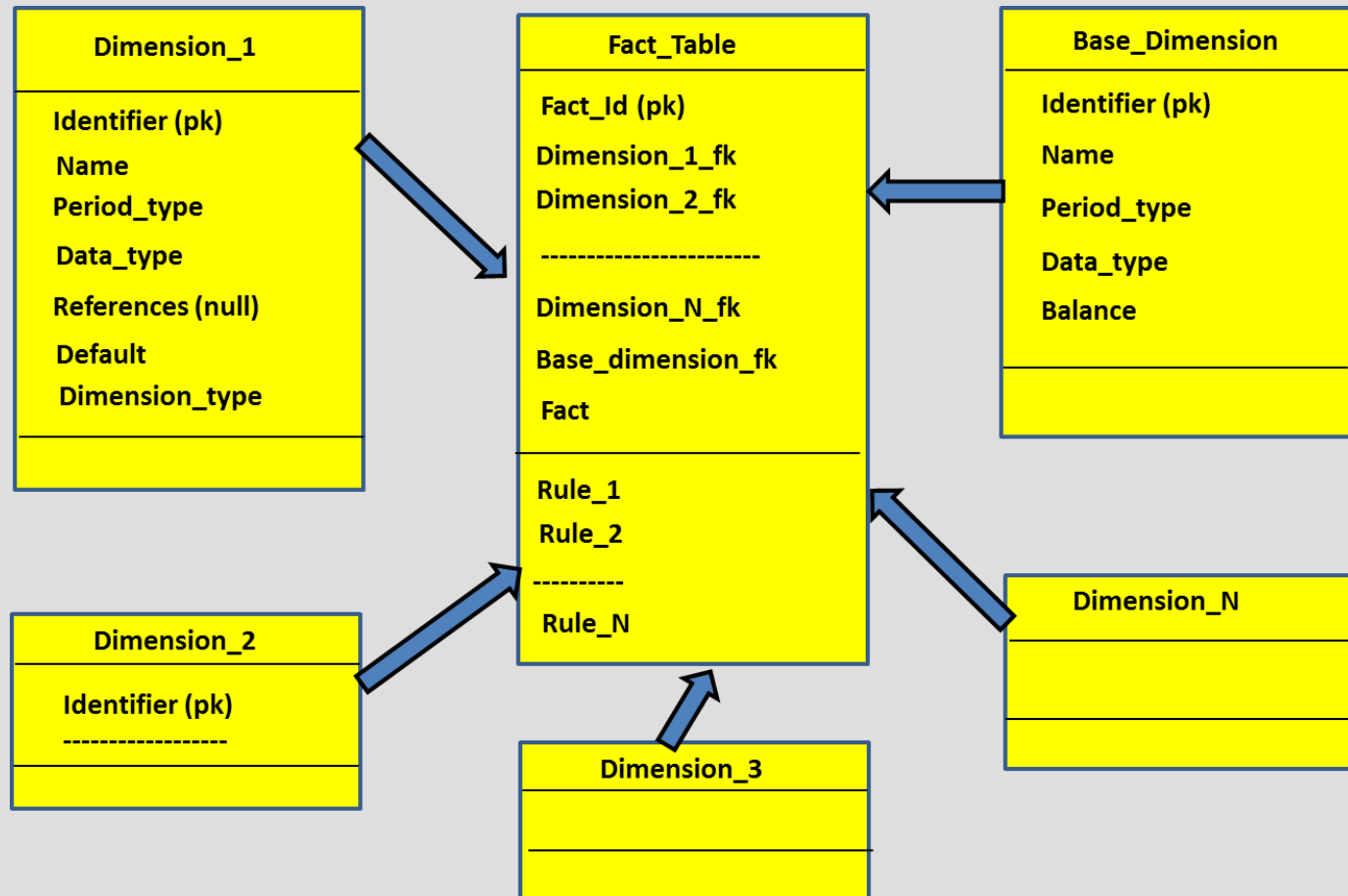
**$(Real\ estate, Assets\_Estate) \cup (To\ bank\ itself, Loans) \cup (Bankia, Entity) \cup (Madrid, Geography) \cup Assets \rightarrow \varphi_5$**

**$(Real\ estate, Assets\_Estate) \cup CA_{t_1} \cup (Bankia, Entity) \cup (Madrid, Geography) \cup Assets \rightarrow \varphi_7$**

- **Forbidden:**

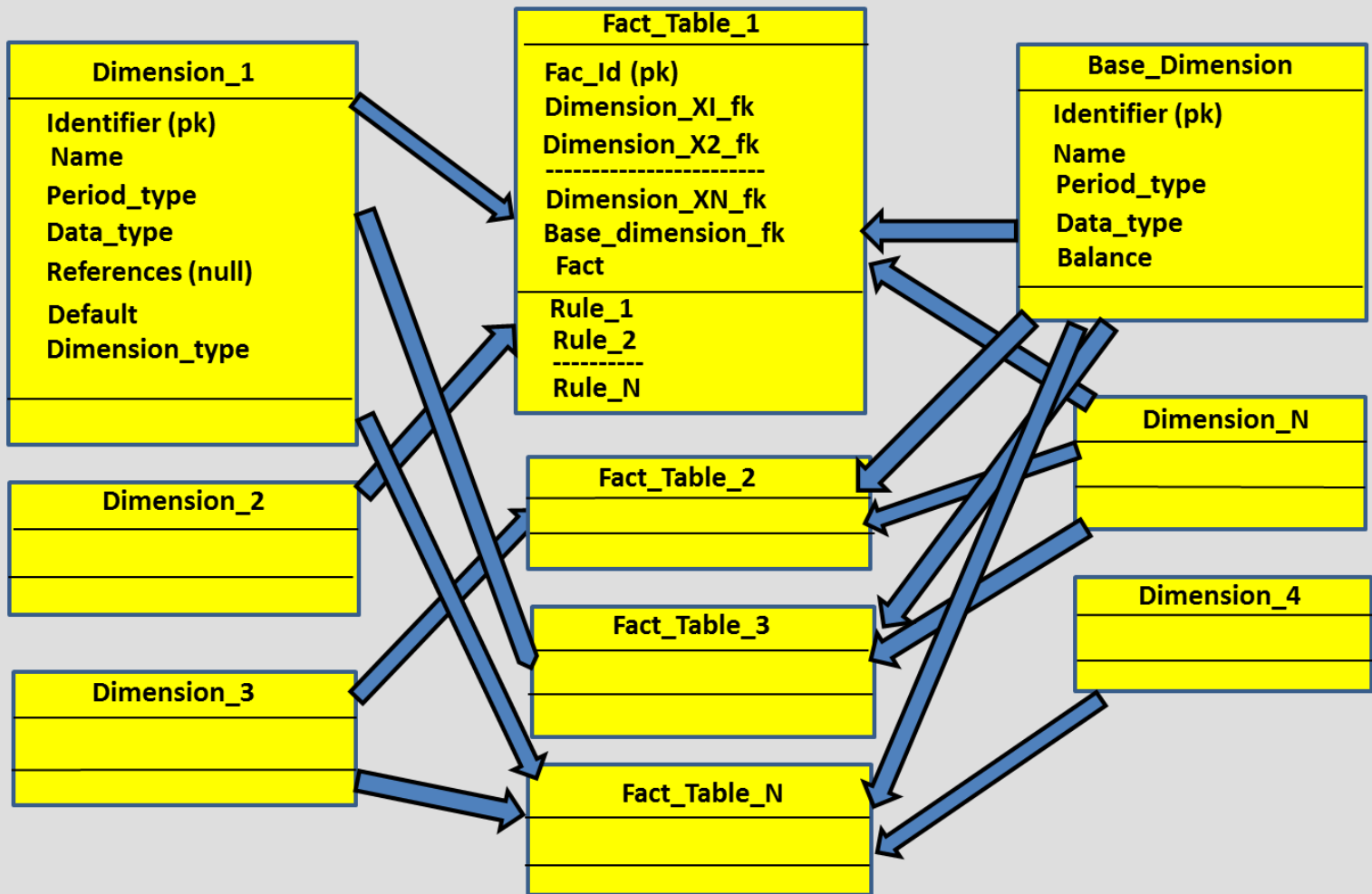
**$(Real\ estate, Assets\_Estate) \cup CA_{t_1} \cup (Bankia, Entity) \cup (Madrid, Geography) \cup Assets \rightarrow \emptyset (\varphi_7)$**

# DPM vs. MDM XIV



DW of the XBRL metadata

# DPM vs. MDM XV



DM of the XBRL metadata

# CONCLUSIONS

- **CWA1.**
- **Mapping DPM  $\leftrightarrow$  MDM.**
- **Definitions, rules, constraints.**
- **Automatization of the process.**
- **Proof of the concept.**



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