UML Meta model for DPM

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UML Meta model for DPM

Definition of a Data Point Model

- DPM is a dictionary of business concepts and their properties
- used in tables (explicitly indicated in annotation)
- identifying the content of every data point and its relation to other data points.

Developed at:
- EIOPA
- EBA
A Data Point as a financial concept is characterized by defining its basic financial meaning (nature) and specifying information of breakdowns in which it is described in different tables or paragraphs of documentation.
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Process of Data Point Modelling
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Background for the development

- ambiguity in the understanding of the concept of a Data Point Model
- missing rule set to be followed in the process of Data Point modelling
- different constraints depending on the field of application
- missing abstraction layer to ease the understanding for IT experts
- missing description of the relations between the different components of a Data Point Model
The Data Point Meta Model should provide

- (1) the model components for the creation of a formal model on sets of data points for European supervisory reporting frameworks,
- (2) rules on how to combine these components and
- (3) the meaning (semantic) of the components and their relations.

Similar to a model construction kit for toys it provides the modelling principles with all characteristics available for use by the modeller.
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The different levels of meta modelling

- Meta meta model
- Meta model
- Modelling language
- Object system
- Model system

- Meta meta model defines notation to Meta modelling language
- Meta model conforms to Meta modelling language
- Model system represents Object system

Described by and conforms to relationships are also depicted in the diagram.
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Decisions taken on the modelling approach for the DPM Meta model

UML Model

conforms to

conforms to

Data Point Meta model

defines notation

described by

defines notation

described by

UML

UML + OCL

Data Point Model

OCL (Object Constraint Language) is a formal language for specifications. It refers to an UML model to describe constraints about the objects in the model.
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Different perspectives on the meta model

- Perspectives reduce the complexity and provide views on different aspects of the object system
- Perspectives needed to be consistent and complete as a whole

Object system

Model system

Front view

Side view

Top view

Inconsistency

modelling
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Perspectives on the DPM Meta Model

- Structural
- Versioning
- Dimension Validation
- Hierarchical
- Presentation
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Definition of constraints

- General constraints on DPMs
- Data warehouse specific constraints
- European XBRL Taxonomy specific constraints

1.01 Each Public Element MUST have a code.
For each Public Element a technical code MUST be defined.

```plaintext
context PublicElement inv:
  self.code->size() = 1
```

1.02 Each Public Element MUST have at least one label.
At least one label for a Public Element MUST be given which provides the human readable meaning of this element.

```plaintext
context PublicElement inv:
  self.label->size() >= 1
```
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The DPM Meta Model

❖ eases the understanding of DPMs for IT experts by using the standard modelling language UML,
❖ reduces the complexity of DPMs by showing only the relevant aspects,
❖ provides syntax and semantics to ease the automation of IT tasks
  ❖ like generating data formats for the reporting processor
  ❖ validation checks on basis of the constraints defined,
❖ enables the derivation of a database design (relational as well as multidimensional).
Thanks for your attention

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