

External Catalogues in INTERLIS Models

Peter Staub, Kanton Glarus | 2021-07-22

What seems to be the problem?

«Traditional» models:
enumeration domains

```
FooClass  
  
+Type : (foo1,foo2,foo3)  
+...  
+...
```

Advantage: super simple

BIG disadvantage:

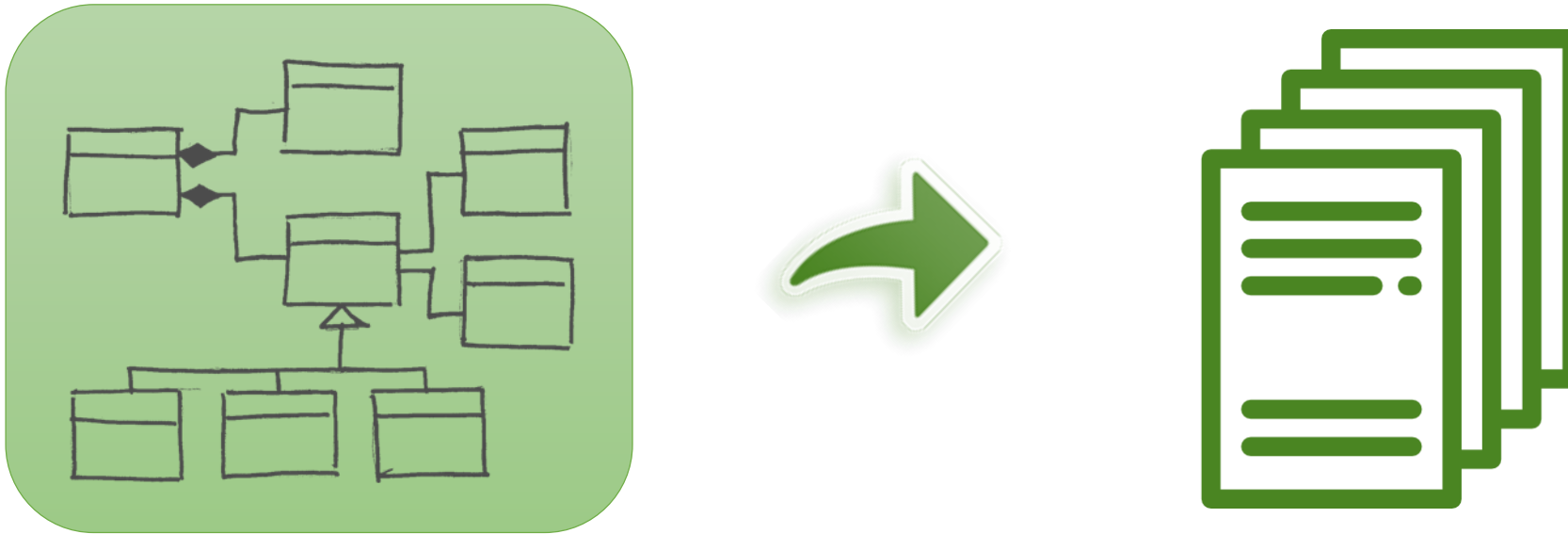
Enumeration values are *hard coded*



Adding or editing enum. values =
model change!

Solution: externalise enumerations!

Uncouple model definitions (static!) and enumeration values (not so static!)



- As a consequence, feasible references to data objects must be added.
- Enumeration *values* are *not* defined in the model, only the catalogue's structure.
- Catalogue items (i.e. «enumeration values») are normal XML data.

How do external catalogues work? (1)



1. Define a class with all attributes wanted being «the catalogue».
2. Define a structure to reference any catalogue item from a data object. . /.
3. Pack the catalogue class and the reference structure in a separate TOPIC or even a separate MODEL.
4. Generate the data for the catalogue, save it as INTERLIS XML.
5. Publish the data model incl. catalogue *and* catalogue data in your repository.
6. Import the data model and then the catalogue data to your GIS/DB.
7. Start editing your data objects and reference existing catalogue items.

How do external catalogues work? (2)



A catalogue consists of a class and a reference structure.

Catalogue {CLASS}

+TypeName : TEXT
+TypeRange : 0..999
+...

CatalogueReference {STRUCTURE}

+Reference : REFERENCE TO -> Catalogue

By adding an attribute of type «Catalogue-Reference» in a model class, the catalogue «Catalogue» is implemented:

FooClass

+Type : CatalogueReference
+...
+...

Abstract example

```
INTERLIS 2.3;  
MODEL MyModel (en) AT "mailto:localhost" VERSION "2021-07-20" =  
IMPORTS CatalogueObjects_V1;
```

```
TOPIC Catalogues =
```

```
  CLASS Cat42 EXTENDS CatalogueObjects_V1.Catalogues.Item =  
    TypeName : MANDATORY TEXT;  
    TypeCode : TEXT*2;  
  END Cat42;
```

The *actual* catalogue

```
  STRUCTURE Cat42Ref EXTENDS CatalogueObjects_V1.Catalogues.CatalogueReference =  
    Reference (EXTENDED) : REFERENCE TO (EXTERNAL) Cat42;  
  END Cat42Ref;
```

```
END Catalogues;
```

```
TOPIC MyDataTopic =
```

```
DEPENDS ON MyModel.Catalogues;
```

```
  CLASS MyClass =  
    Type : MANDATORY MyModel.Catalogues.Cat42Ref;  
    AnyOtherMeaningfulAttribute : TEXT;  
    AndSoOn : TEXT;  
  END MyClass;
```

References to
catalogue items

```
END MyDataTopic;
```

```
END MyModel.
```

Datasets

	t_id [PK] bigint	datasetname character varying(200)
1	1	catalogue
2	2	actual_data
*		

Baskets

	t_id [PK] bigint	dataset bigint	topic character varying(200)
1	3	1	MyModel.Catalogues
2	4	2	MyModel.MyDataTopic
*			

Catalogue items (table cat42)

	t_id [PK] bigint	t_basket bigint	typename text	typecode character varying(2)
1	10	3	Foo	
2	11	3	Bar	XY
3	12	3	Fubar	aa
*				

(ili2pg.jar --import --dataset catalogue ...)

Actual data (table myclass)

	t_id [PK] bigint	t_basket bigint	atype bigint	anyothermeaningfulattribute text	andsoon text
1	13	4	10	blah blah	
2	14	4	10	boo boo	u-huh
3	15	4	12	lorem ipsum	wow
*					



Note:
While working with *ili2pg*, and depending on your model's inheritance structure, you do not need to cope with the «reference-structure-table» `cat42ref` at all!
The reference to the catalogue is implemented right in `cat42`.

cat24.xtf

```
<?xml version="1.0" encoding="UTF-8"?><TRANSFER xmlns="http://www.interlis.ch/INTERLIS2.3">

<HEADERSECTION SENDER="..." VERSION="2.3">
<MODELS>
  <MODEL NAME="CatalogueObjects_V1" VERSION="2011-08-30" URI="http://www.geo.admin.ch"></MODEL>
  <MODEL NAME="MyModel" VERSION="2021-07-20" URI="mailto:localhost"></MODEL>
</MODELS>
</HEADERSECTION>

<DATASECTION>
  <MyModel.Catalogues BID="3">
    <MyModel.Catalogues.Cat42 TID="10">
      <TypeName>Foo</TypeName>
    </MyModel.Catalogues.Cat42>
    <MyModel.Catalogues.Cat42 TID="11">
      <TypeName>Bar</TypeName>
      <TypeCode>XY</TypeCode>
    </MyModel.Catalogues.Cat42>
    <MyModel.Catalogues.Cat42 TID="12">
      <TypeName>Fubar</TypeName>
      <TypeCode>aa</TypeCode>
    </MyModel.Catalogues.Cat42>
  </MyModel.Catalogues>
</DATASECTION>

</TRANSFER>
```


mydata.xtf

```
<?xml version="1.0" encoding="UTF-8"?><TRANSFER xmlns="http://www.interlis.ch/INTERLIS2.3">

<HEADERSECTION SENDER="..." VERSION="2.3">
<MODELS>
  <MODEL NAME="CatalogueObjects_V1" VERSION="2011-08-30" URI="http://www.geo.admin.ch"></MODEL>
  <MODEL NAME="MyModel" VERSION="2021-07-20" URI="mailto:localhost"></MODEL>
</MODELS>
</HEADERSECTION>

<DATASECTION>
  <MyModel.MyDataTopic BID="4">
    <MyModel.MyDataTopic.MyClass TID="13">
      <Type>
        <MyModel.Catalogues.Cat42Ref>
          <Reference REF="10"></Reference>
        </MyModel.Catalogues.Cat42Ref>
      </Type>
      <AnyOtherMeaningfulAttribute>blah blah</AnyOtherMeaningfulAttribute>
    </MyModel.MyDataTopic.MyClass>
    <MyModel.MyDataTopic.MyClass TID="14">
      <Type>
        <MyModel.Catalogues.Cat42Ref>
          <Reference REF="10"></Reference>
        </MyModel.Catalogues.Cat42Ref>
      </Type>
      <AnyOtherMeaningfulAttribute>boo boo</AnyOtherMeaningfulAttribute>
      <AndSoOn>u-huh</AndSoOn>
    </MyModel.MyDataTopic.MyClass>
    ...
  </MyModel.MyDataTopic>
</DATASECTION>
```

Productive Example

Forest districts in Glarus

- Model documentation: http://models.geo.gl.ch/pdf/GL_Forstreviere_V1.pdf
- Data model: http://models.geo.gl.ch/ili/GL_Forstreviere_V1.ili
- Catalogue: http://models.geo.gl.ch/xml/GL_Forstreviere_V1_Kataloge.xml

(German only...)