IVOA roles, VOTABLE utypes and VO-DML

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Recent discussion about TAP
HEALPIX tagging on the mailinglits

- Recent discussion on DAL and Apps list: how to mark a column with HEALPIX index

- Extended to order, NESTED/RING etc..

- What is needed is a little HEALPIX model

- Some people (Rick Hessman) propose to define ucds and combine them =

  – pos.healpix.order is ucd pos.healpix;meta.number

  – pos.healpix.tiling   is ucd   pos.healpix;pos.wcs.ctype

- Pierre said : use utypes . They are here . Ucd are for quantities and concepts, not for roles

Distinction ucd/role

- The distinction between ucd (for astronomical quantities and concepts) and roles came out as early as 2003.

- That's why the (VOTABLE) utypes where invented.

- They are used, but new utypes defiitions seem to be discouraged

VOTABLE Utype attribute use

- Beautifull example is SSA: you know exactly what is in the table in each column thanks to utypes
- Obscore has the same but it's less usefull because names are also fixed by the standard
- (names = utypes in one sense)
- Aladin recognize char.coverage.support in whatever table to draw images « field of views »
- Service descriptors in DataLink are RESOURCES tagged with utype « adhoc:service »
- Much other usage in Note by Graham et al 2013.
- They are really usefull and could be more: why is it no more developping ?

Relationship to datamodels ,

- The issue is relationship with datamodels
- It has been said in the VO-DML context: utypes are not pointer to attributes.
- For a given attribute in a class they are not unique because they are context dependant (point of view on the model)
- This is exactly what wed are waiting from a role. Eg: Positions « meaning » depend of what they are the position !!
- Can we define rigourosly what a role is

Roles in computer science littérature (quick survey)

- There is a lot in the computer science about role definition and role programming

- Apparently there a lot of « flavors » probably nether fully consistent

- What I found intersting is ORM (Object Role Modelling)

- ORM is oroginal but provide links (mapping) to UML modelling

From roles in ORM to UML

- Roles are used in « facts » they are predicates of sentences telling something about entities.
  - « François | is in Trieste »
- Entities play roles completed by « values » (not objects) . Values are not required
  - François is the entity, « is in Trieste » predicate; Trieste the value
- Entities are representative of Entity Types.
  - François is representative of a man

From roles in ORM to UML

- Entities map to UML objects
- « Entity types » map to UML classes
- Values map to …. Values !!!!
- Roles map to a combination of relationships and class/attribute + values
- François | is in the city of | Trieste

      object   relationship+   value

                  city class attribute

VO-DML notation

- Facts decompose in smaller facts
- Roles chain themselves ro buildd complex roles
- Decomposition of roles in smaller roles sequences is possible
- VO-DML has VO-DML roles (inside a class)and VO-DML types for attributes
- The trick could be that VO-DML roles are unitary pieces of the role decomposition.
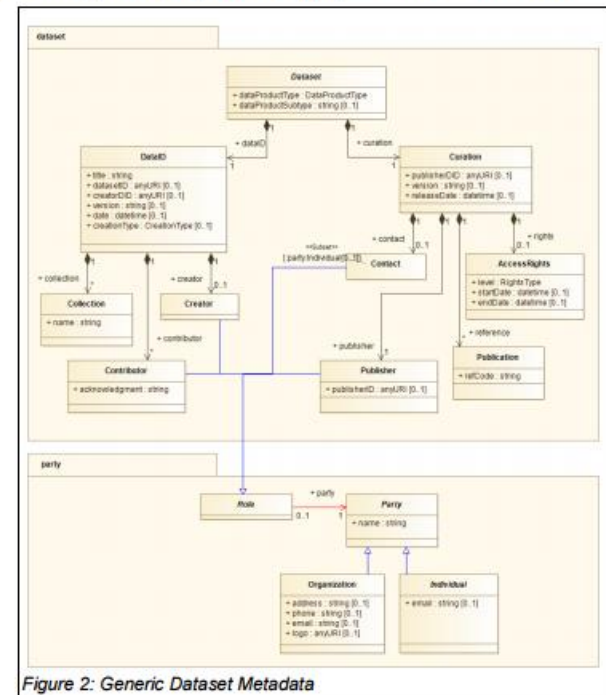- VO-DML types help to go further in the branches of roles

Dataset Metadat example

The dataset identified ivo://SoAndSo belongs to collection CFHTLS

This dataset is curated by CADC

Thousands of such statements in our query responses

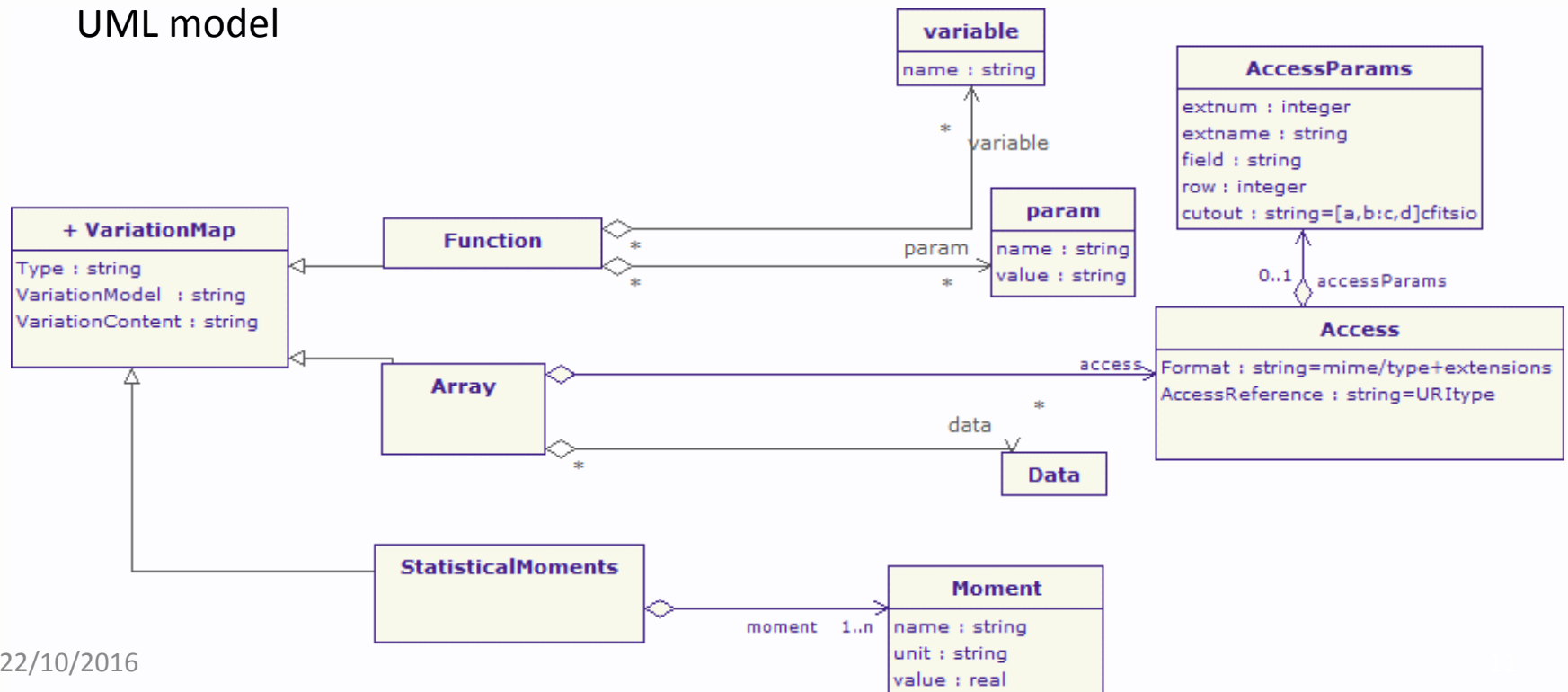a). Where applicable, we provide the appropriate citation in the text below.

Figure 2: Generic Dataset Metadata

Char 2 example

My image of tonight at CFHT/megacam is centered on 10.0 +60.0

My image has a variaton Map modelized by a 2D polynomious of degree five whose parameters are {1,2, 3., 4. 5. , 7. ......}
Query responses gather hundreds or thousands of such facts. Map to the UML model

Conclusion : don't be afraid using VOTABle attributes

- Let's try to map existing utypes to VO-DML structures

- Put utypes on your VOTABLE structure to help application recognizing the role it plays in the landscape