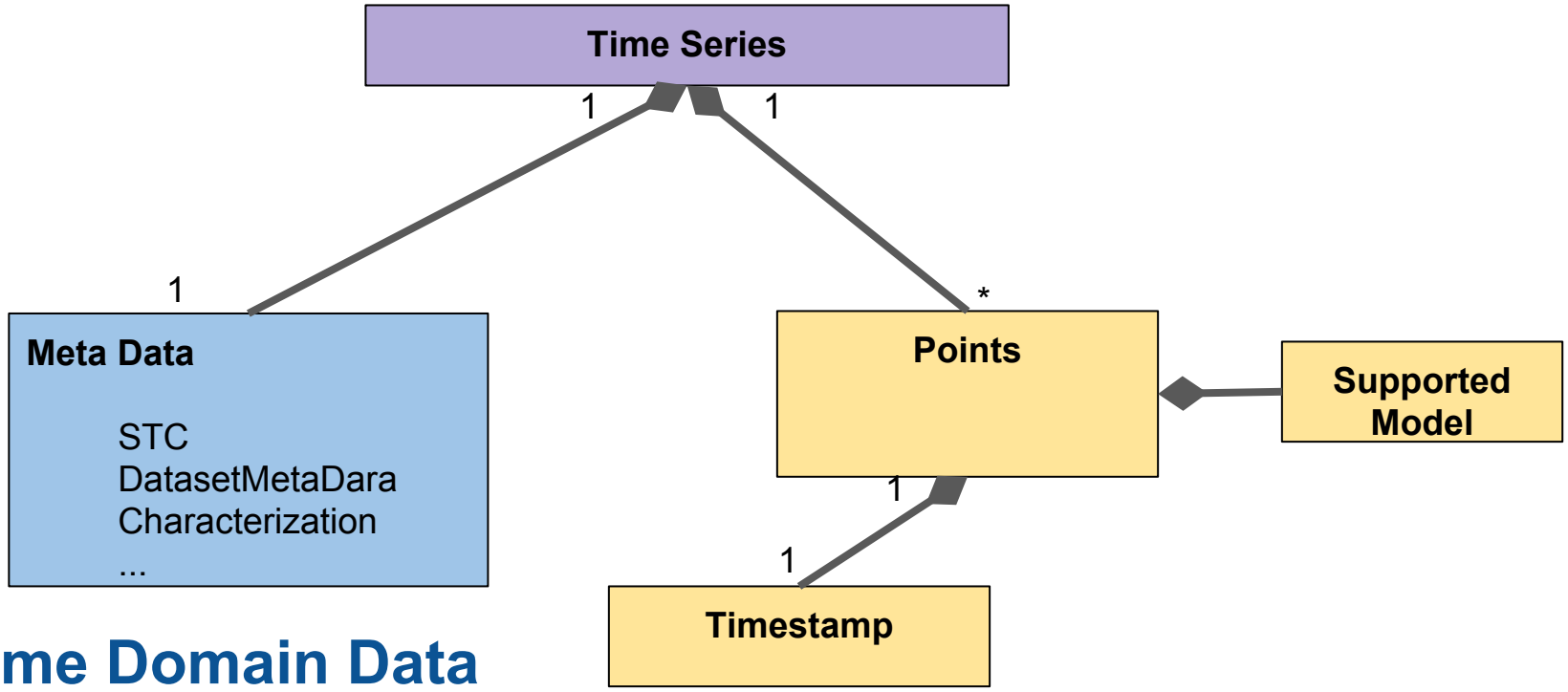
Mapping Time Domain Data in VOTables

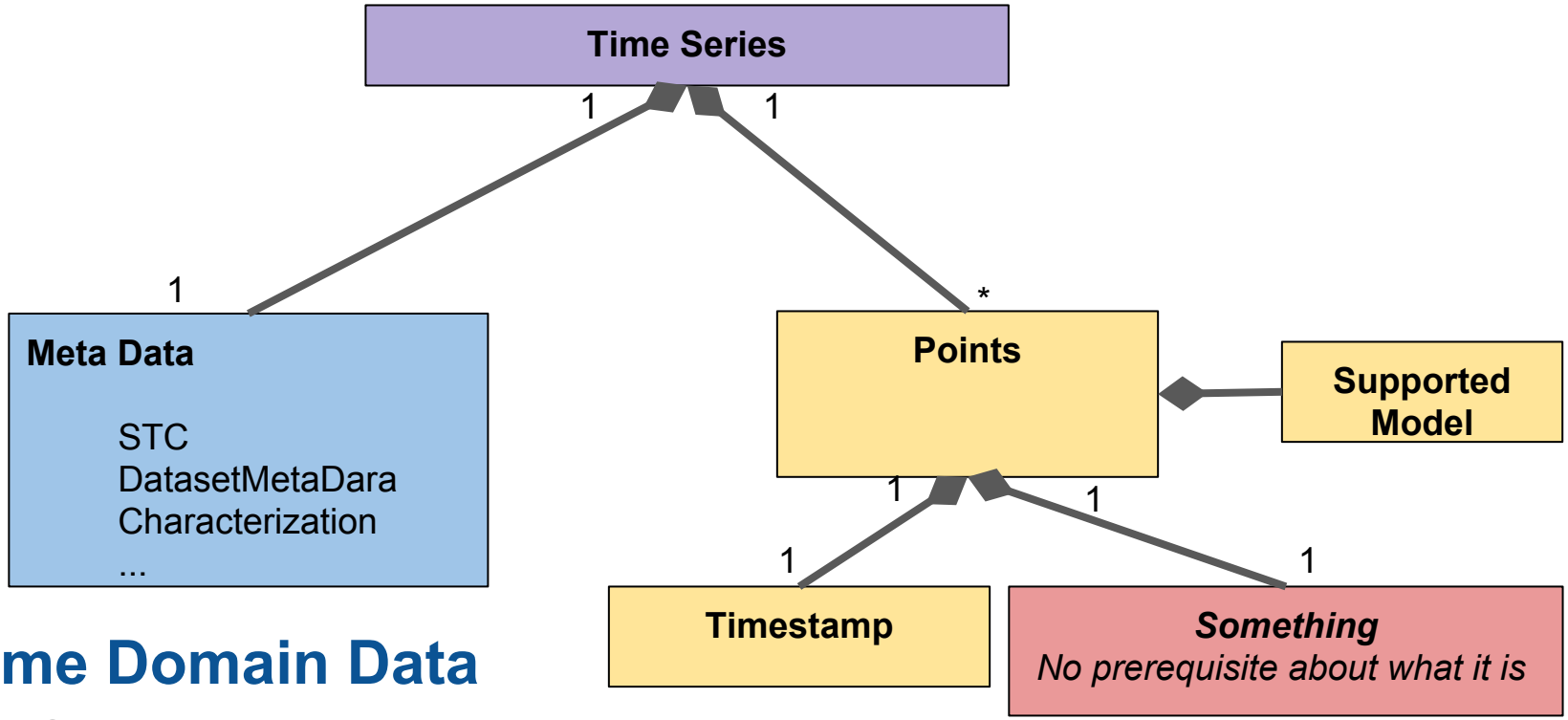
A general approach to map *Anything*

Conceptual Model



- **Time Domain Data**
  - Some metadata
  - A set of points
    - A TimeStamp
    - A set of values taken at that time
      - All with the same schema
      - Don't know anything more about that schema

Conceptual Model



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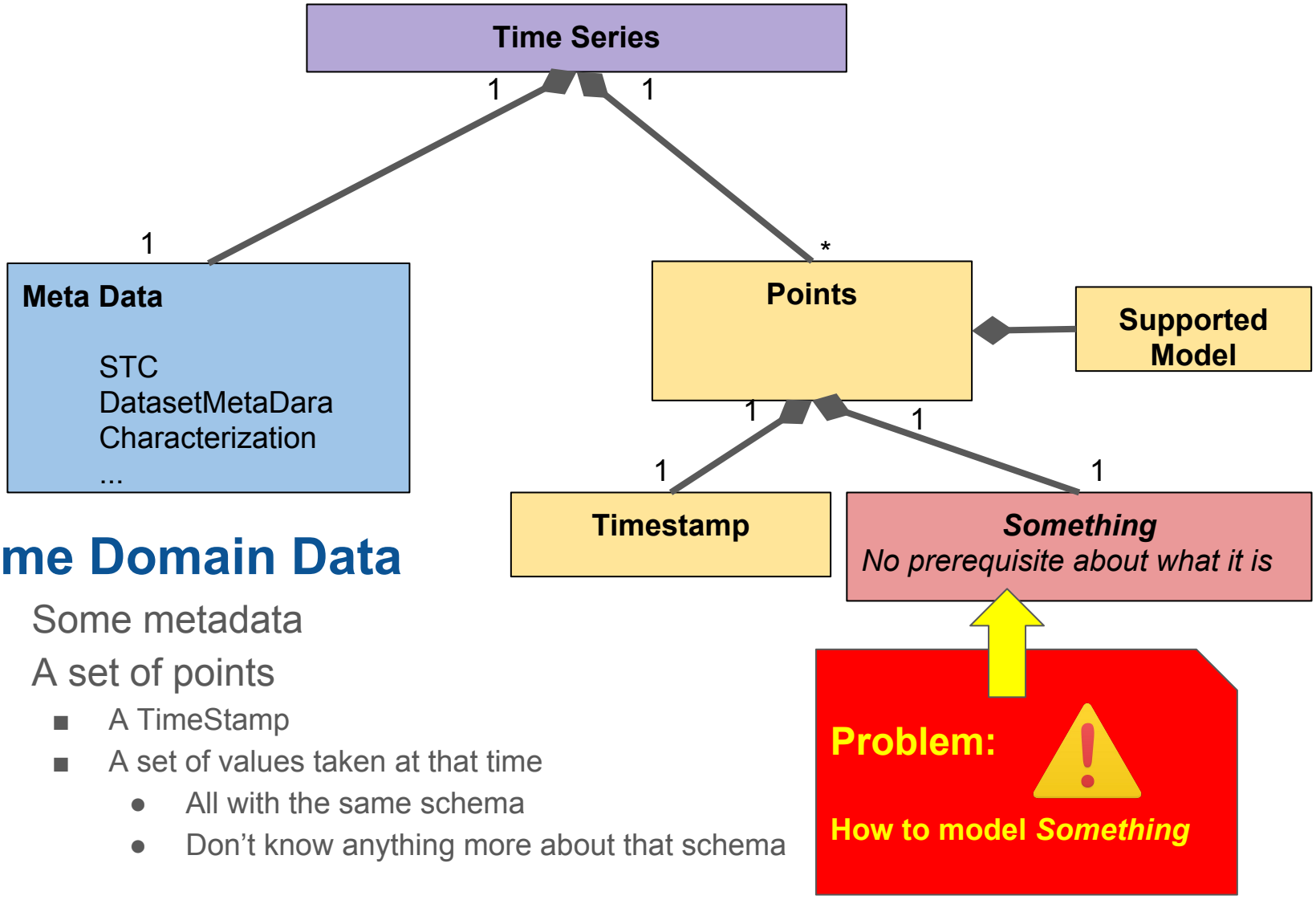

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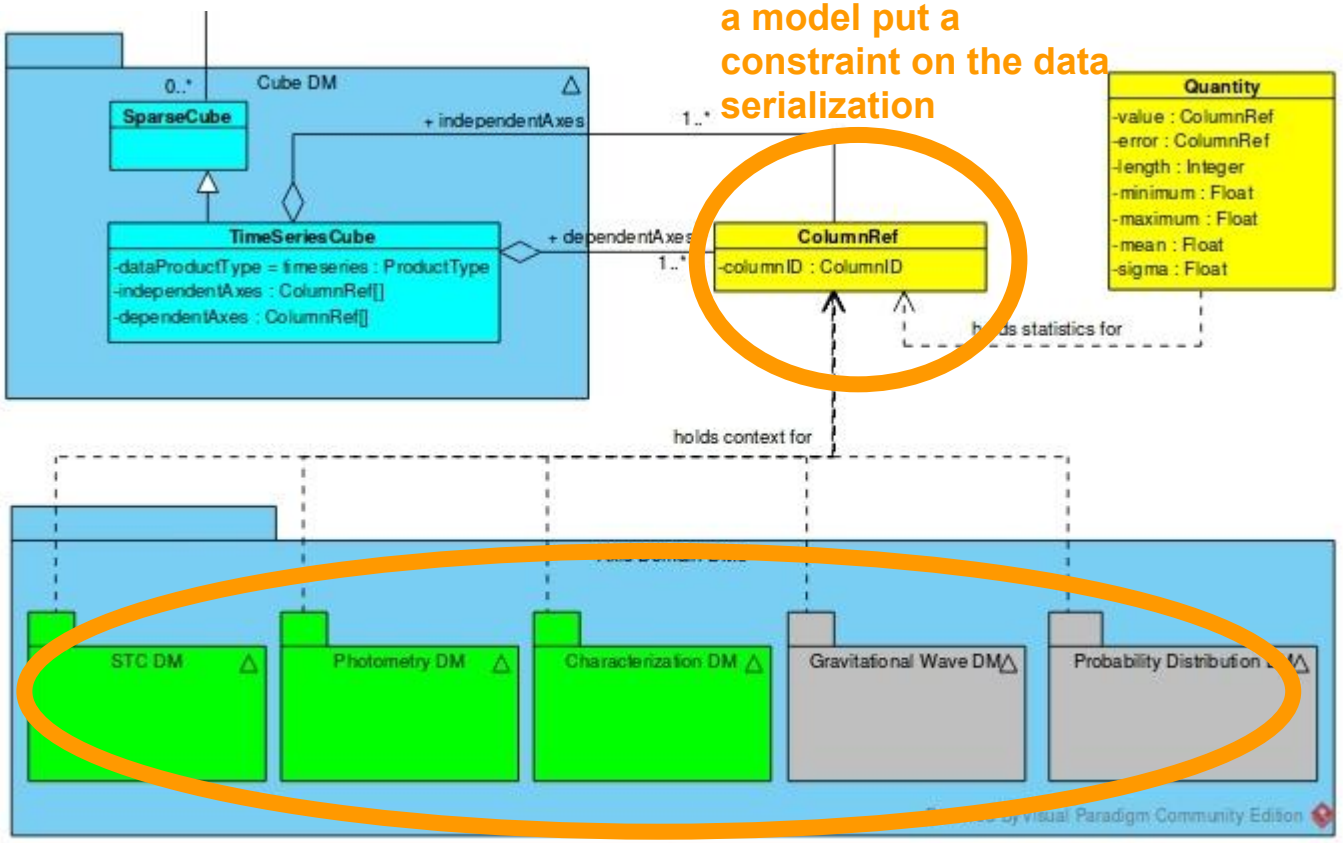
Approach #1 (Jiri)

- **A Restrictive Approach**
  - Limiting ***Anything*** to a set of use cases well identified
    - See NDCube or Jiri's note

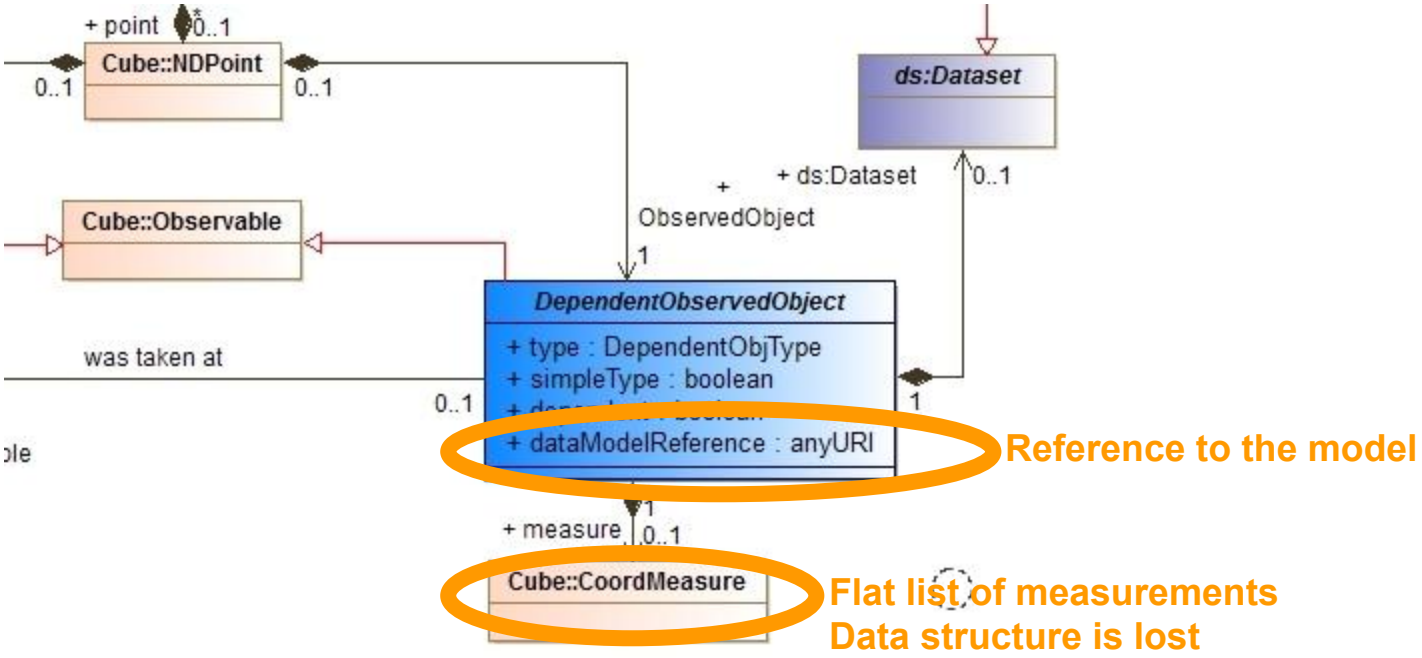
WARNING:
Referencing column in a model put a constraint on the data serialization



List of models supported by the TS model

Approach #2 (M. Louys)

- **Either a Dataset or a set of values**
  - Dependant axis values refer to one model (any model)
  - The model ignores the data structure

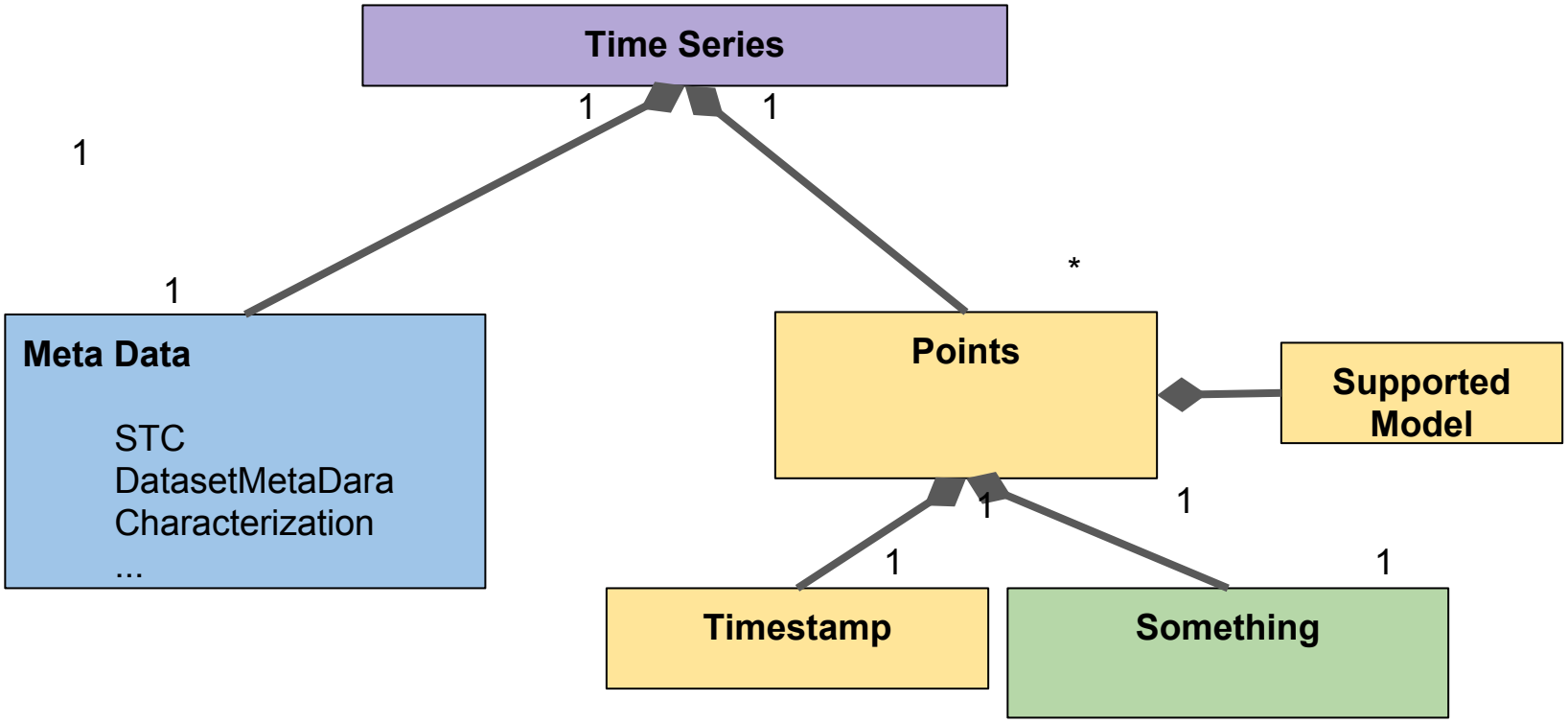


TS Model Purpose: Client Point of View

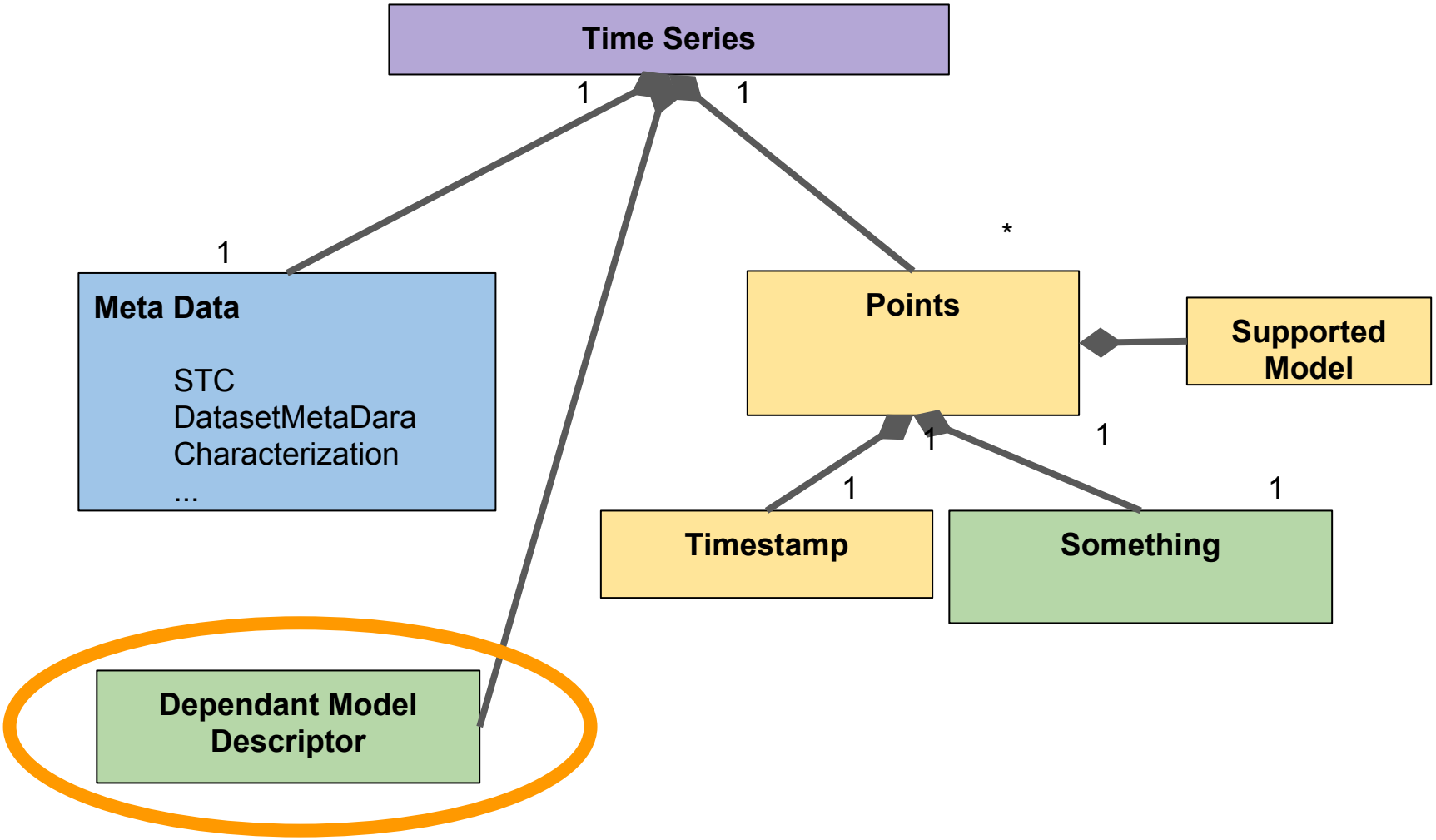
- **Defining meta-data**
  - Axis characterizations
  - Axis frames
  - Observation description
  - Done in any cases
- **Understanding Data**
  - Identifying time stamps
  - Identifying dependant data
  - Understanding the meaning the dependant quantities
    - A model reference can provide semantics about those quantities

No Need to describe the content of the dependant axis in the model

Conceptual Model

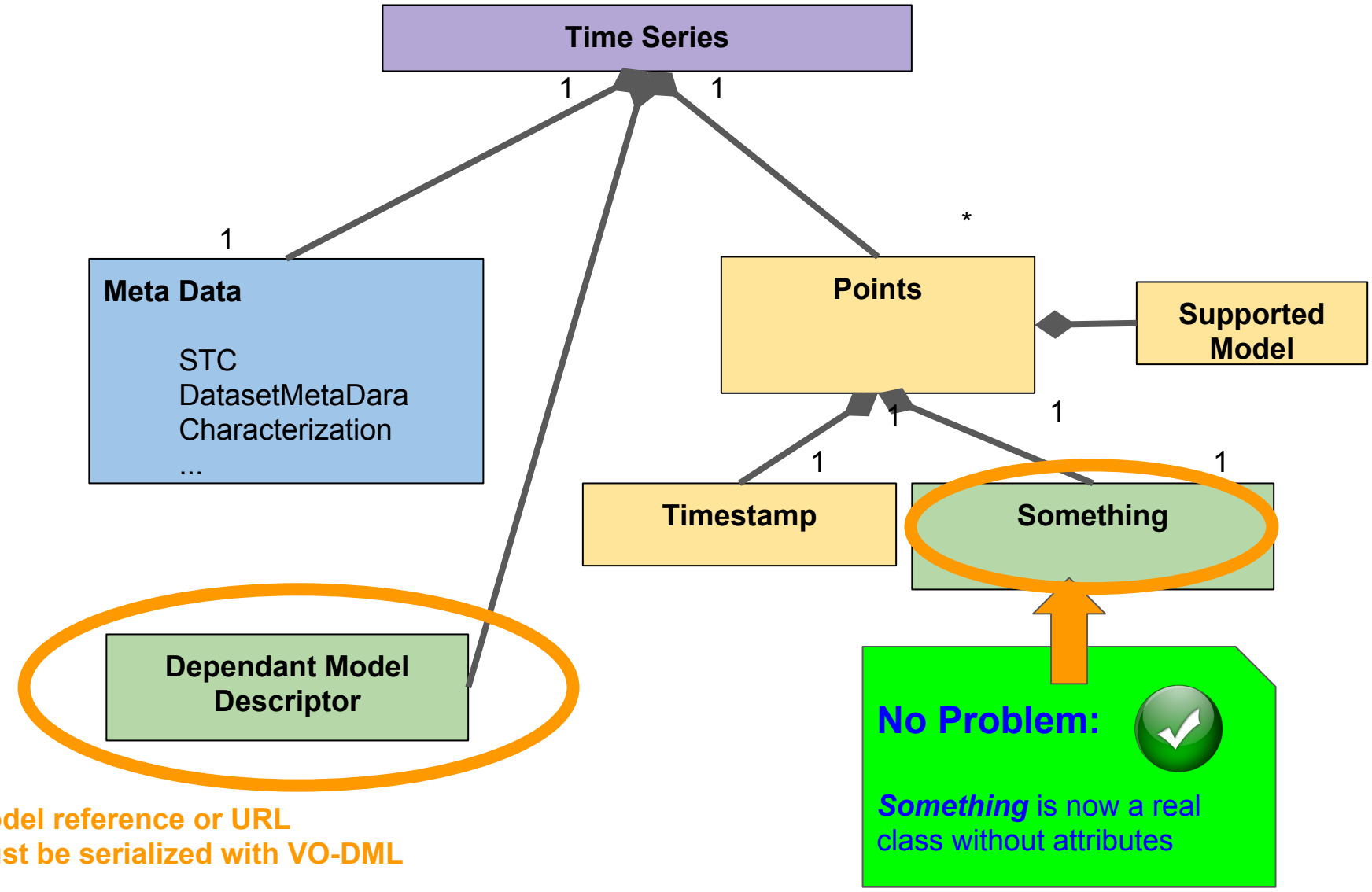


Conceptual Model



Model reference or URL
Must be serialized with VO-DML

Conceptual Model



Mapping in a VOTable

This VOTable contains a time series

```
<MODEL>
    <NAME>lmtimeserie</NAME>
    <URL>http://volute.g-vo.org/svn/trunk/projects/dm/vo-dml/models/tesselation/lmtimeserie.vo-dml.xml</URL>
    <IDENTIFIER>ivo://ivoa.org/dm/sample/LMSource/0.1</IDENTIFIER>
</MODEL>
<MODEL>
    <NAME>lmobservable</NAME>
    <URL>http://volute.g-vo.org/svn/trunk/projects/dm/vo-dml/models/tesselation/lmobservable.vo-dml.xml</URL>
    <IDENTIFIER>ivo://ivoa.org/dm/sample/LMObservable/1</IDENTIFIER>
</MODEL>
```

Resolve the model namespace

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Resolve the model namespace

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<TEMPLATES tableref="_table1">
    <TUPLE dmtype="lmtimeserie:TimeSerie">
        <TUPLE dmrole="lmtimeserie:TimeSerie.TimeAxis" dmtype="lmtimeserie:TimeAxis">
            <VALUE dmrole="lmtimeserie:TimeAxis.TimeFrame" table_ref="_0117pYWsEJmSbhJP" />
        </TUPLE>
        <TUPLE dmrole="lmtimeserie:TimeSerie.ObservableAxis" dmtype="lmtimeserie:ObservableAxis">
            <VALUE dmrole="lmtimeserie:TimeSerie.ObservableModel" source="child">lmobservable</VALUE>
        </TUPLE>
        <COLLECTION dmrole="lmtimeserie:TimeSerie.Points" dmtype="lmtimeserie:Point" arraysize="*">
            <TUPLE dmtype="lmtimeserie:Point">
                <VALUE dmrole="lmtimeserie:TimeAxis.TimeStamp" table_ref="timestamp_100" />
                <TUPLE dmtype="lmobservable:Observable">
                    <VALUE dmrole="lmobservable:Observable.long" table_ref="pos_ra_csa_100" />
                    <VALUE dmrole="lmobservable:Observable.lat" table_ref="pos_dec_csa_100" />
                    <VALUE dmrole="lmobservable:Observable.velocity" table_ref="velocity_100" />
                    <VALUE dmrole="lmobservable:Observable.imag" table_ref="image_100" />
                    <VALUE dmrole="lmobservable:Observable.magnitude" table_ref="magnitude_100" />
                <TUPLE>
            </TUPLE>
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</MODEL>
<MODEL>
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Reference to the dependant axis model

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            </TUPLE>
        </COLLECTION>
    </TUPLE>
</TEMPLATES>
```

Reference to the dependant axis model

Data Mapping on dependant axis model identified by a namespace

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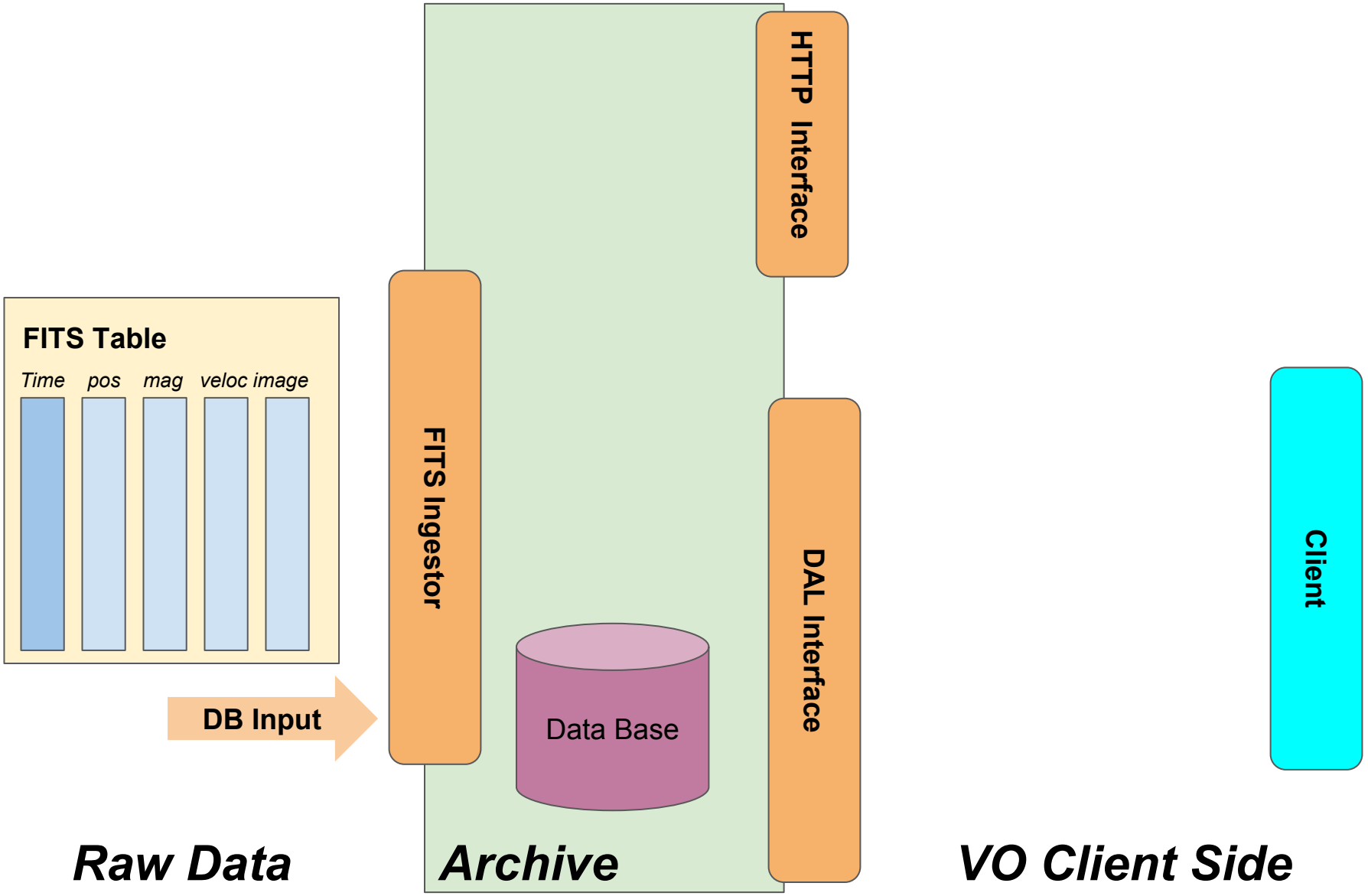
Workflow Example



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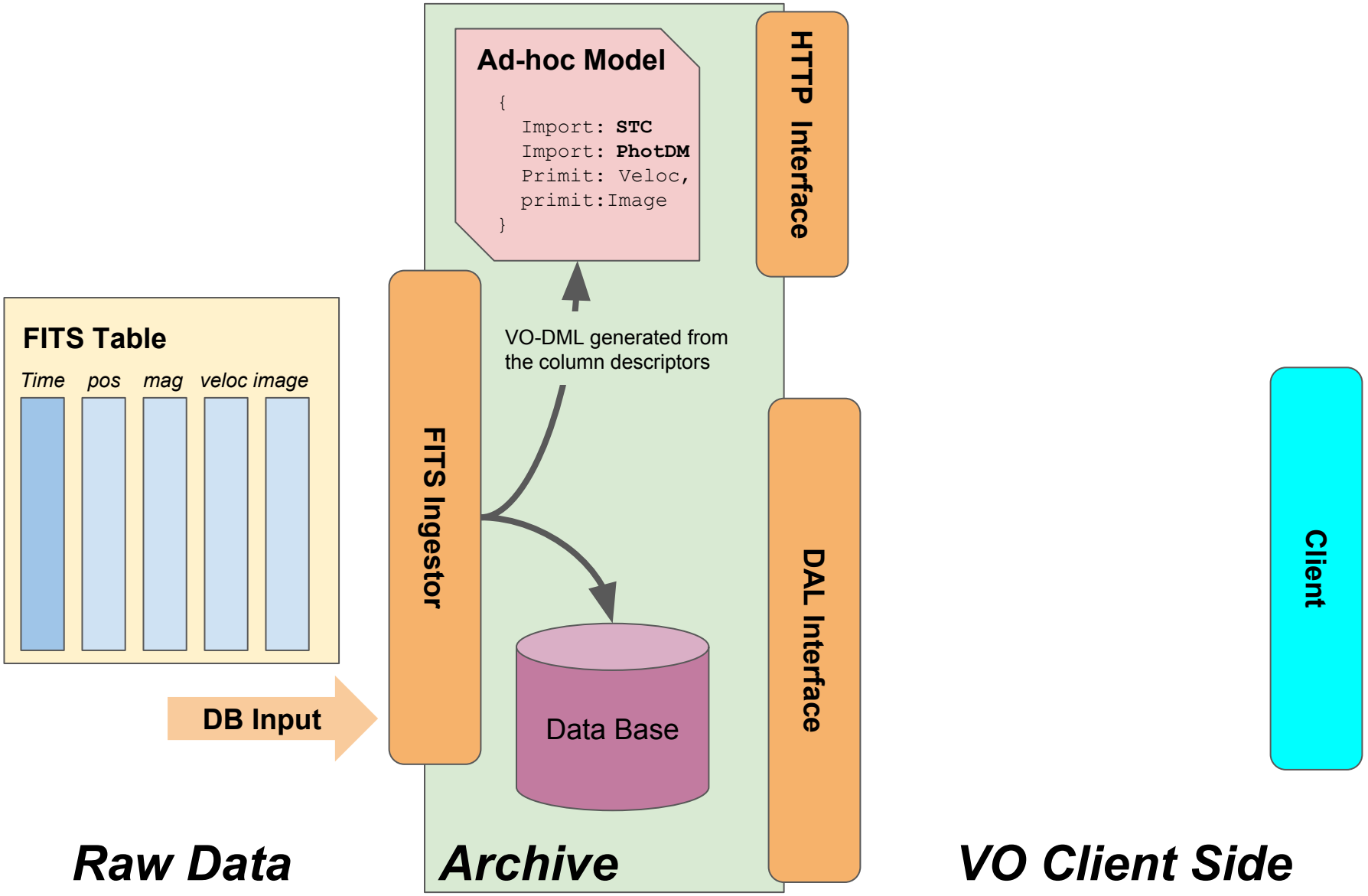

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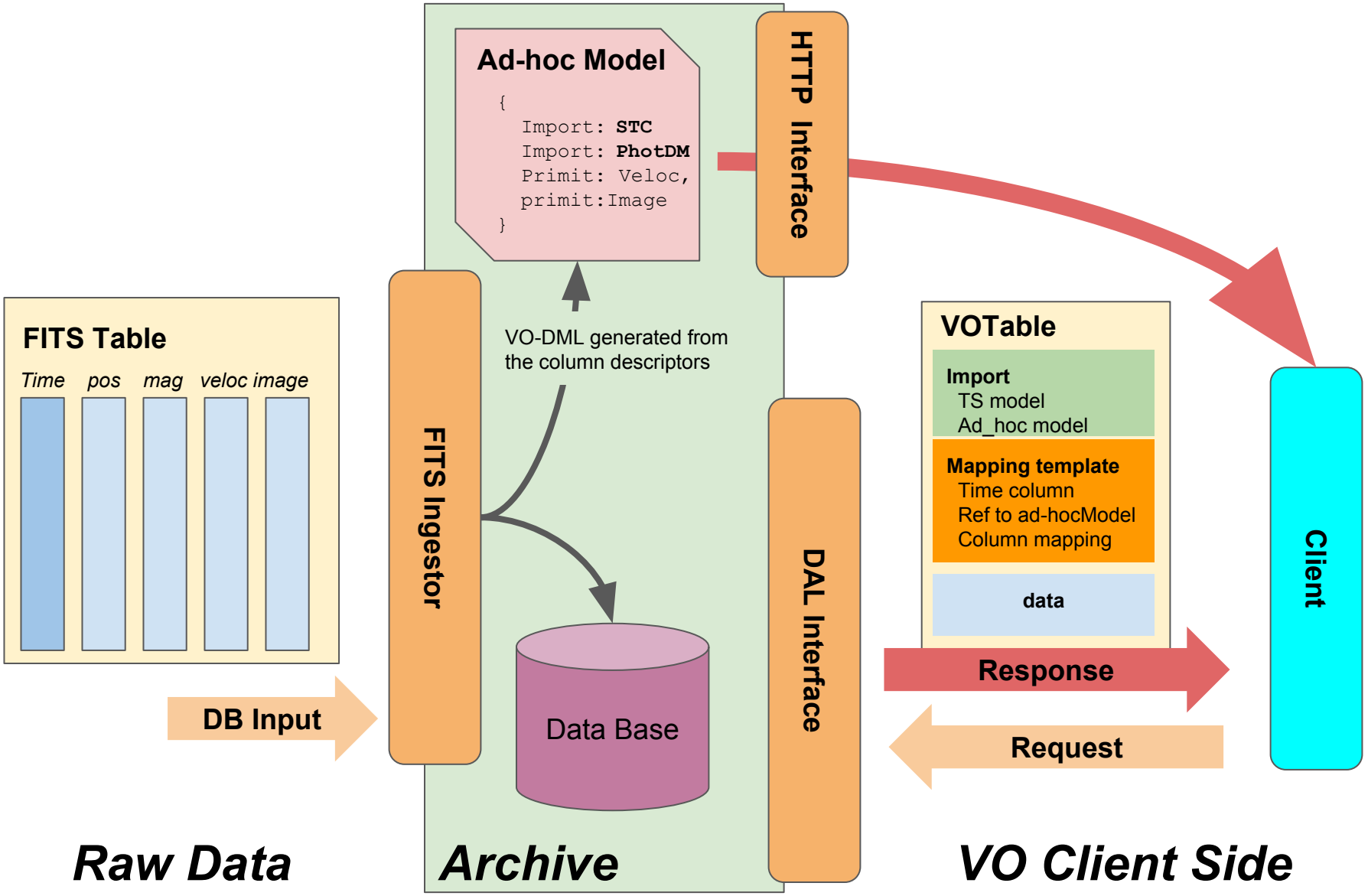

Conclusions

- **Dependant axis described by a model**
  - VO or ad-hoc model
  - Serialized in VO-DML
  - Published on line
- **Dependant model not part of the TS model**
  - Just a reference
  - Set as an instance value
- **Dependant model resolved by the client**
  - Mapping block of the dependant instances bind with this of the time axis
- **This feature can be inserted into the Mireille's proposal**
- **It can be applied beyond the time domain**