



Dagstuhl 2021

Interoperability for Cross-Domain Research: Use
Cases for Metadata Standards

DDI-CDI / NGSII-LD Interoperability
Problem statement

The INTERSTAT Project

- Open Statistical Data Interoperability Framework
- Co-financed by the Connecting Europe Facility
- Partners
 - Industry: Engineering and Fiware
 - Public: Istat and Insee

The INTERSTAT Project

“The overall objective of INTERSTAT is to develop a framework that will allow the interoperability, by using technical assets and common ontologies, between national statistical portals and the European Data Portal, and the deployment of cross-border services that reuse European statistical open datasets from those portals.”

(One of) INTERSTAT's Objectives

Provide uniform technical interfaces for a standard and simple re-use of statistical information through the adoption of CEF **Context Broker** Building Block and the implementation of ETSI **NGSI-LD** API specification.

(One of) INTERSTAT's Pilots

Support for Environment Policies (SEP)

- Use case for local policy makers
- Integrate datasets deriving from:
 - sensor data concerning air pollution
 - statistical data on local demographics
- More detail on [GitHub](#)

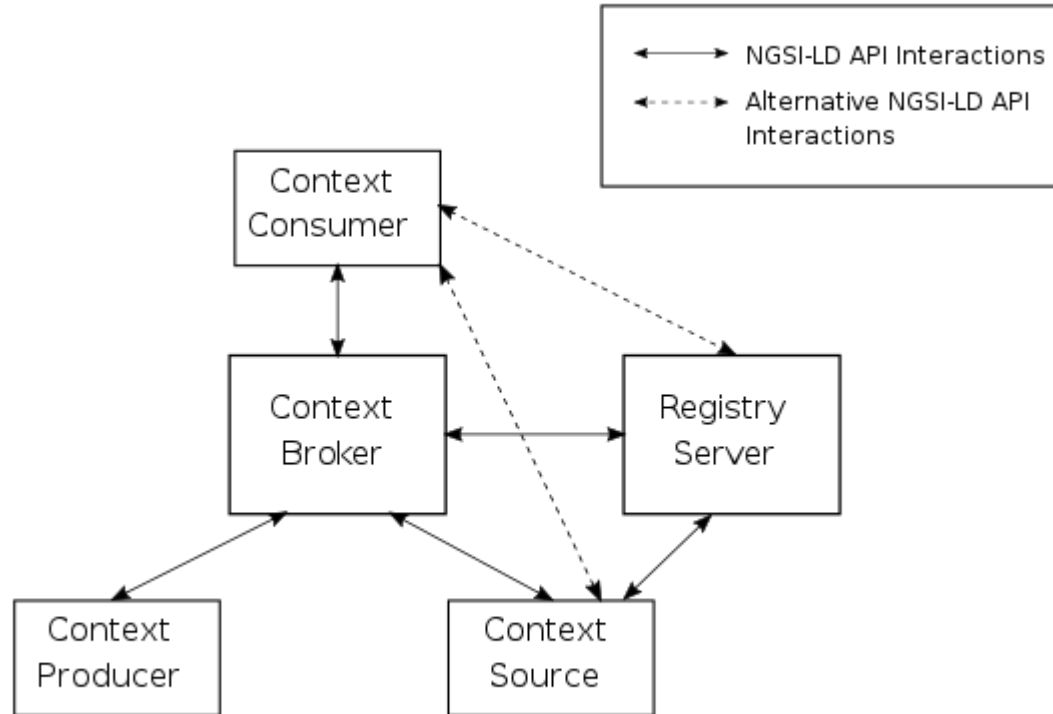
The Context Broker

From Wikipedia:

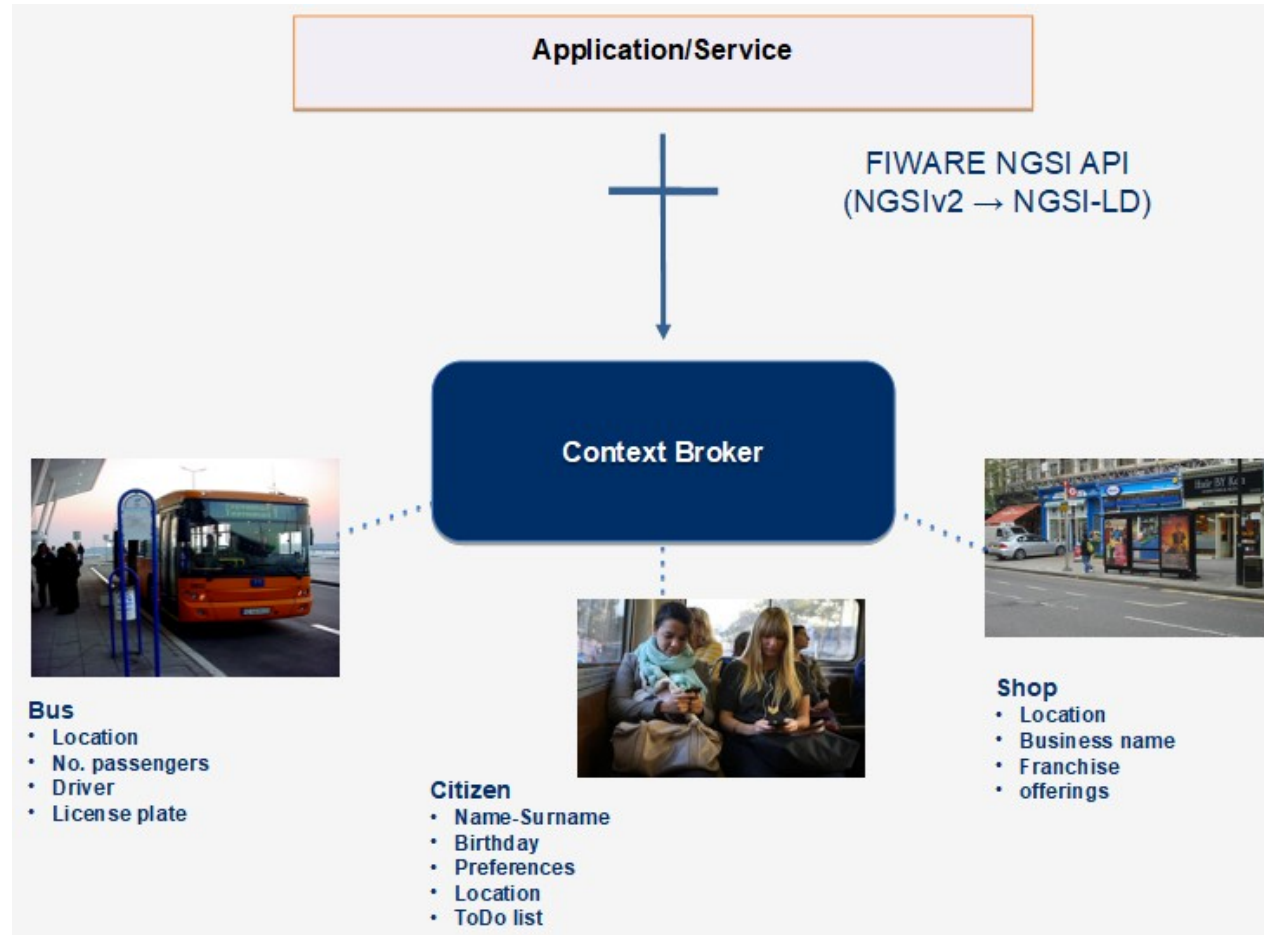
- “In information and communication technologies, context awareness refers to a capability to take into account the situation of entities”
- “A Context Broker acts as the primary access point to context information for Context Consumers”

The Context Broker

Typical architecture:



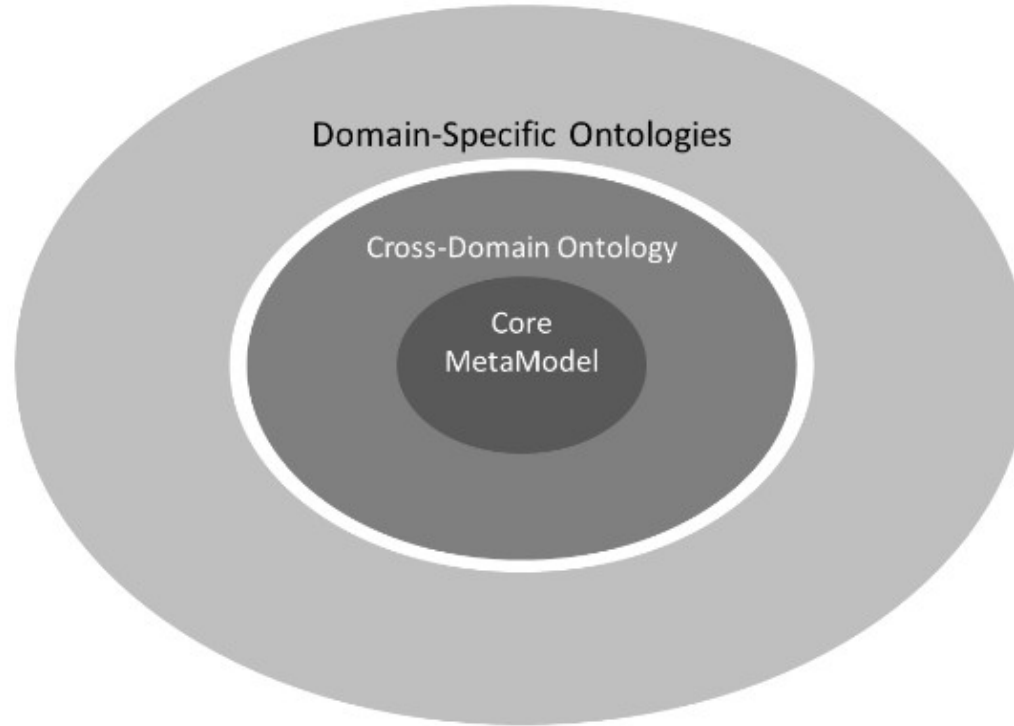
The Context Broker



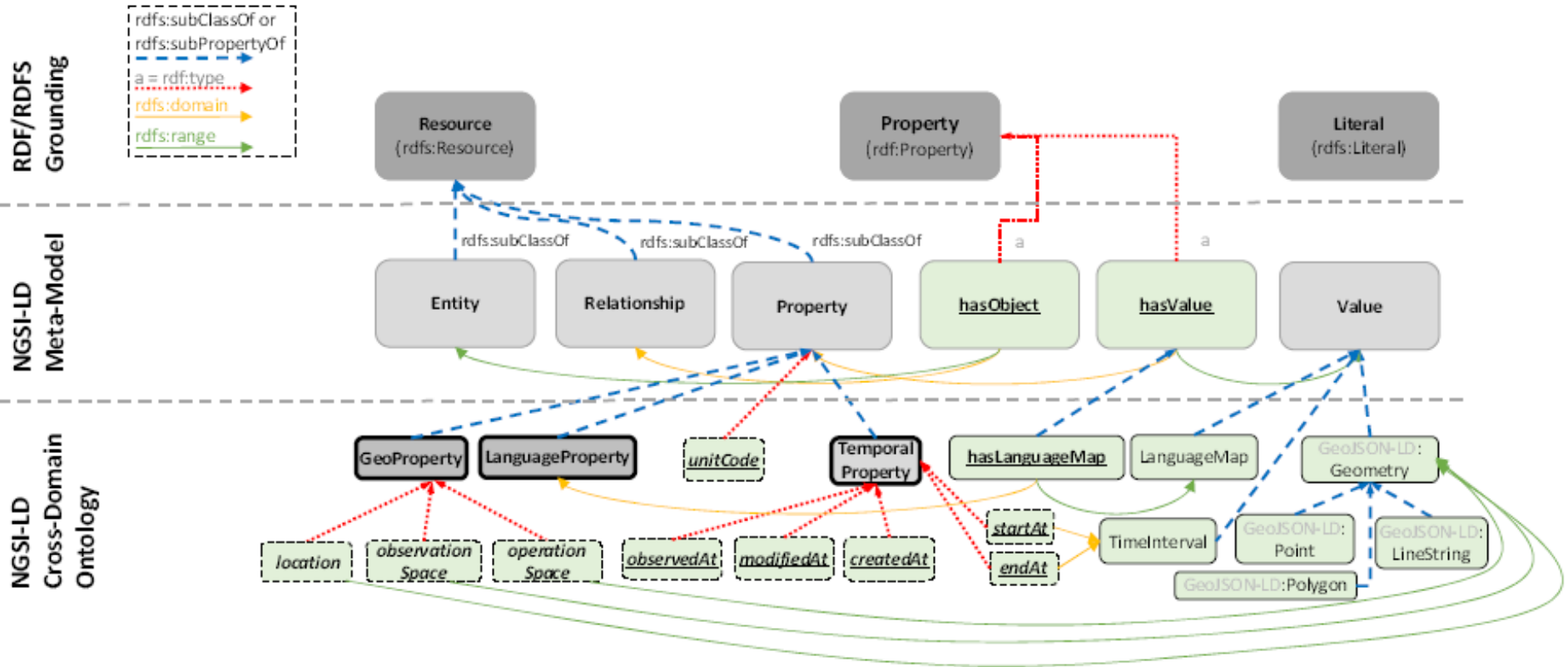
The NGSI-LD Standard

- Information model
- API specification
 - Operations (data consumption and provision, subscriptions, notifications...)
 - JSON-LD serialization
 - HTTP binding
- ...

NGSI-LD Information Model



NGSI-LD Information Model



More in the [specification](#)

NGSI-LD Information Model

Outer layer: smart models



**Smart
Data Models**

- Nice ecosystem at

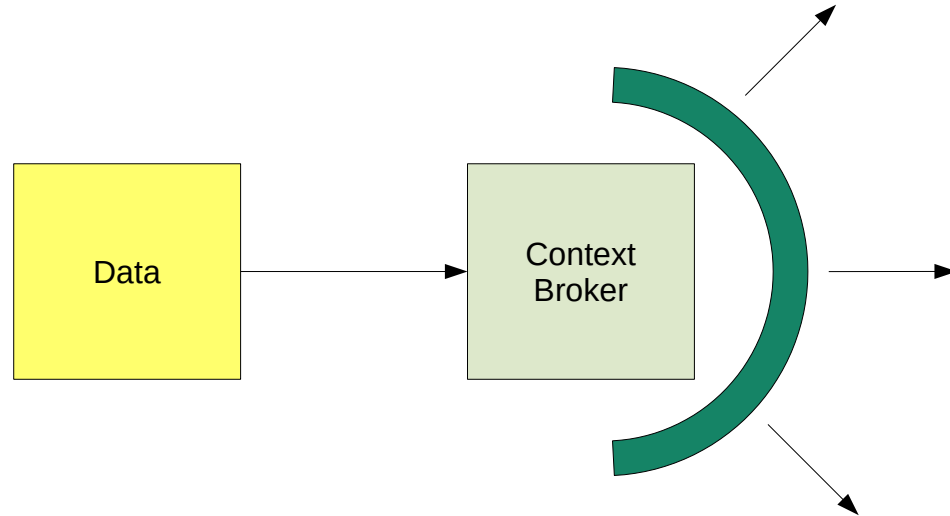
<https://smartdatamodels.org/>

- ~600 models covering various domains (Smart Cities, Smart Water, Smart Energy, Smart Health...)
- Strong policy of reuse between models

Problem statement

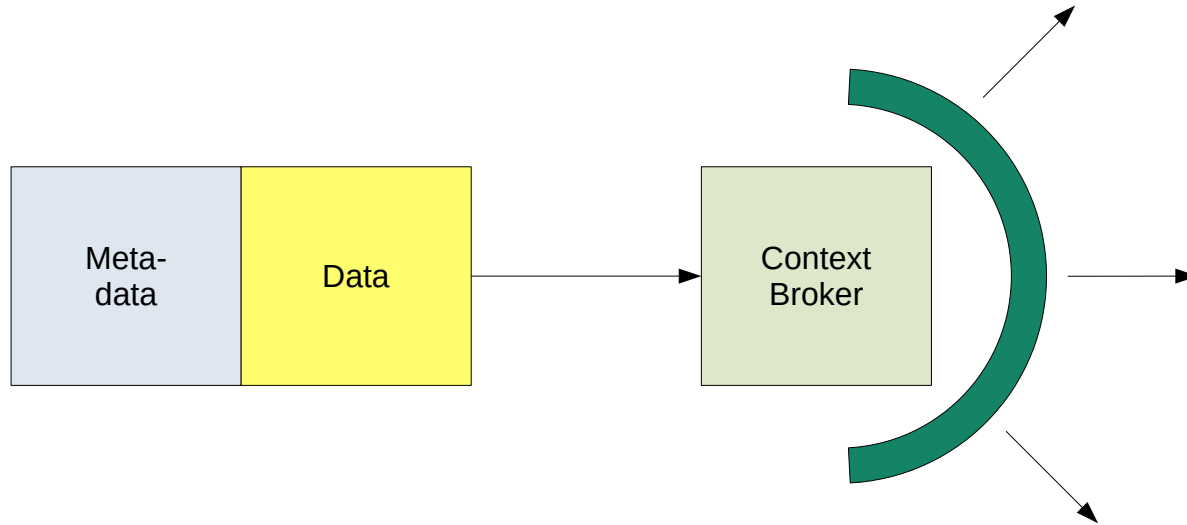
- Overall objective: publish statistical data with the Context Broker
- Boils down to interoperability between NGSI-LD and statistical information models
- Explore the problem on the basis of INTERSTAT pilots, starting with SEP

Problem statement



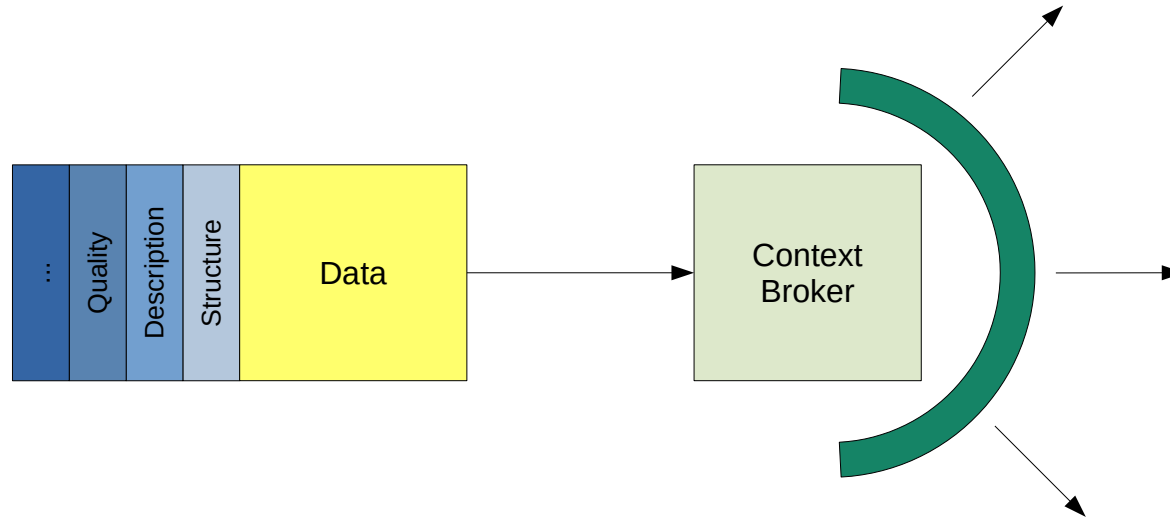
Publish statistical data with the Context Broker

Problem statement



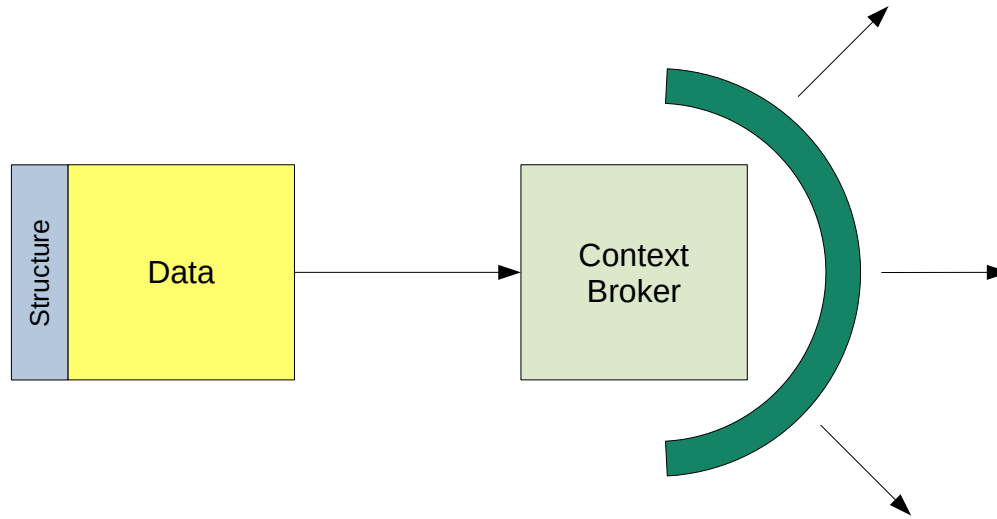
Without metadata, data means nothing

Problem statement



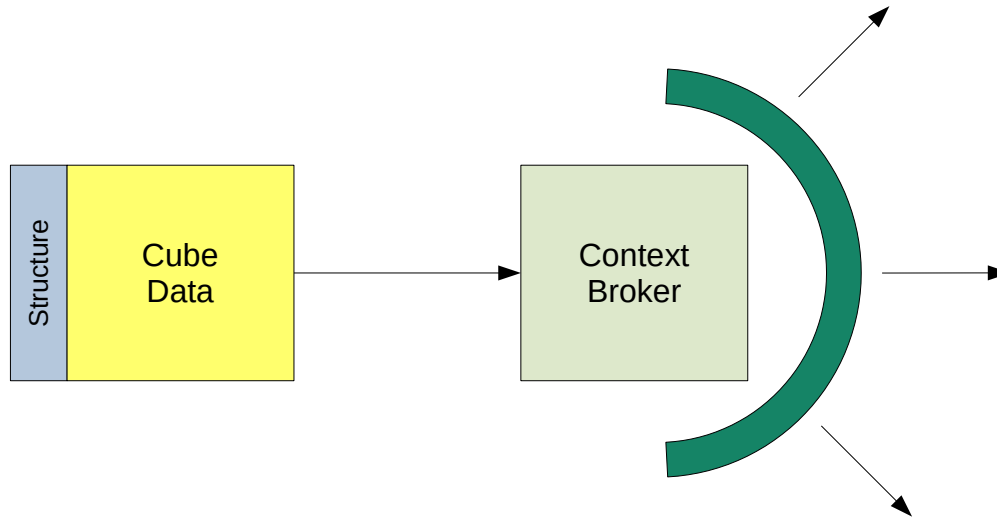
All kinds of metadata

Problem statement



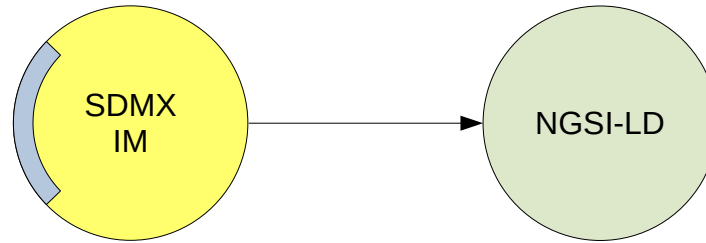
Let us start with structural metadata

Problem statement



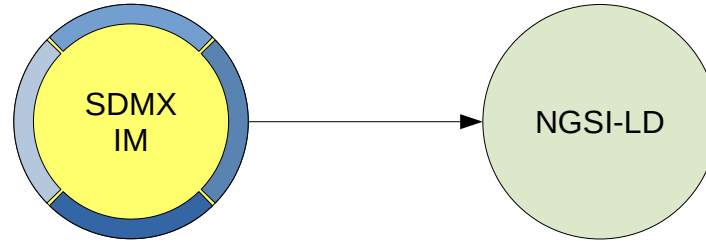
Most statistical data are cube data

Problem statement



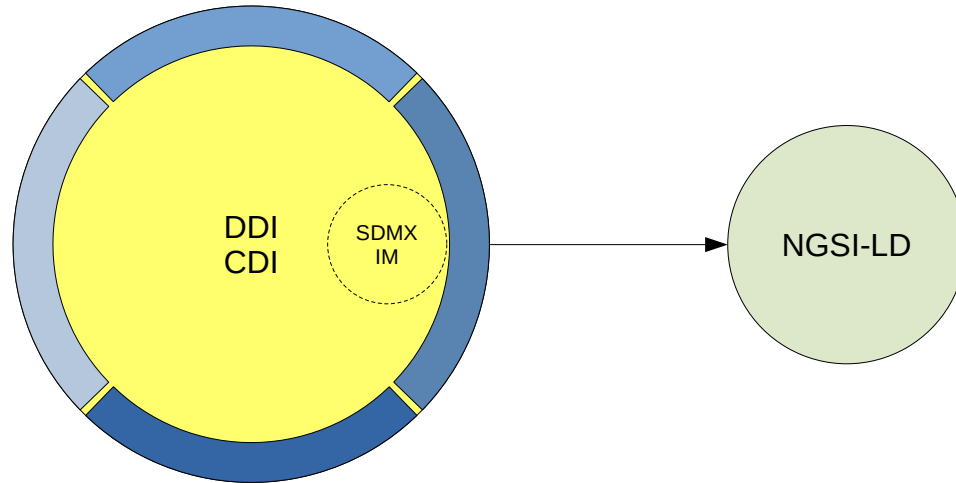
In terms of models

Problem statement



Zoom out: other kinds of metadata

Problem statement



Zoom out: other kinds of data