

# **Towards Generating Policy-compliant Datasets**

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# **Context and Problem**

- Datasets are created and used for a specific purpose, but such data processing is increasingly the subject of various internal and external regulations – e.g., GDPR.
- One particular aspect of GDPR is informed consent, which must by given for these purposes.
- SOTA focuses on compliance analysis of processes; either by analyzing the processes before execution or post-hoc analysis of logs.
- Our hypothesis is that compliance verification can be facilitated by generating datasets "on demand".

## **Research Question**

• Can we generate datasets for a specific purpose "just in time" that complies with informed consent?

## Goal

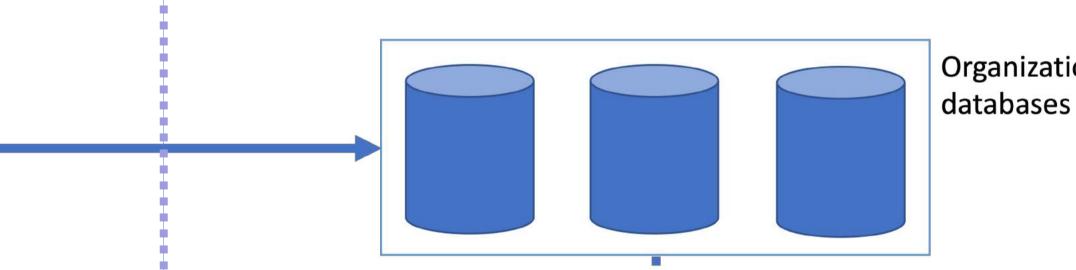
• To propose a method for generating datasets that are fit for a specific purpose and taking into account the ever evolving informed consent of people in a declarative manner, availing of semantic technologies.

# **Potential Impact**

• *Facilitating* compliance verification as part of data governance best practices within an organization

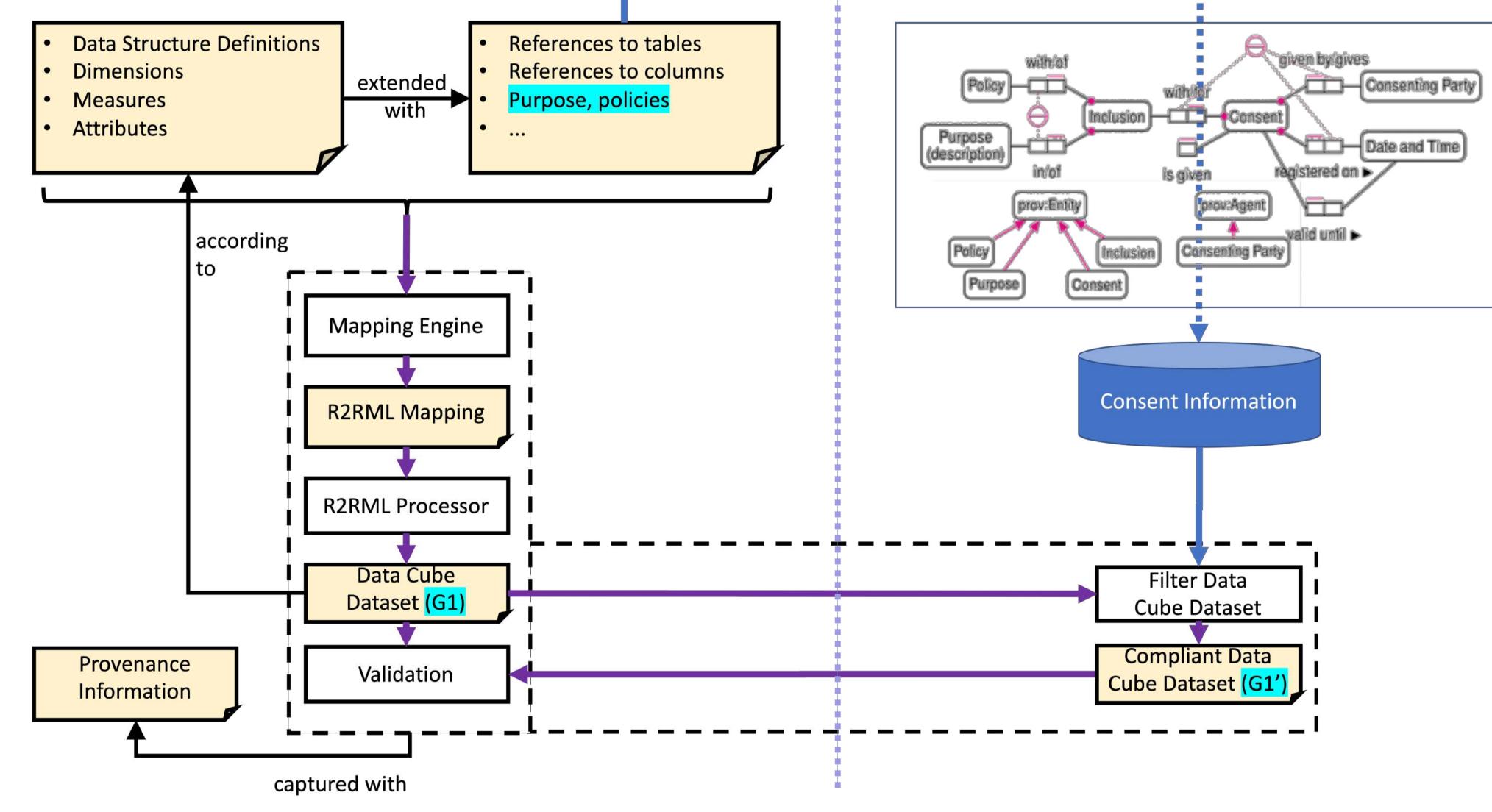
## Approach

Building upon R2DQB [1], allowing one to annotate RDF Data Cube *dataset structure definitions* to generate R2RML mappings that will create a RDF Data Cube dataset.



Organization's

- The Data Structure Definition is given to the R2DQB engine to generate an R2RML mapping. The R2RML mapping is executed resulting in a graph G1
- We execute the DESCRIBE query, resulting in a graph G2. This graph is used to create a list of consent instances (URIs) where the property isGiven is true.



DESCRIBE ?consent WHERE ?consent ont:forInclusion ?inclusion { # GET LATEST INCLUSION OF PURPOSE FOR POLICY SELECT ?inclusion WHERE { ?inclusion ont:ofPurpose <.../purpose> . ?inclusion ont:ofPolicy <.../policy> . <.../policy> dcterms:created ?dt . } ORDER BY DESC(?dt) LIMIT 1 } ?consent ont:givenBy ?user ?consent ont:registeredOn ?datetime . # GET LATEST CONSENT INFORMATION FOR EACH USER FILTER NOT EXISTS { [ ont:forInclusion ?inclusion ; ont:givenBy ?user ; ont:registeredOn ?datetime2 ] FILTER(?datetime2 > ?datetime)

We then use that list to apply the following query to G1 to create a graph G1' only retaining the information of people who have given their consent

DESCRIBE ?obs ?dataset WHERE ?obs a qb:Observation . ?obs qb:dataSet ?dataset . ?obs dct:identifier ?dim VALUES ?dim { <uri1> ... <urin> } }

#### **Demonstration and Results**

#### **Future Work**

- We demonstrated the viability of our approach, using a synthetic dataset, though more experiments are called for.
- All intermediate graphs allow one to trace the various steps traceability and transparency (provenance)
- **References and Links**
- 1. Christophe Debruyne, Dave Lewis, Declan O'Sullivan: Generating Executable Mappings from RDF Data Cube Data Structure Definitions. OTM Conferences (2) 2018: 333-350
- Ontology: <u>http://openscience.adaptcentre.ie/ontologies/consent-mapping-jit/ontology</u>
- Experiment: <u>https://scss.tcd.ie/~debruync/icsc2019/</u>

- A current limitation is a lack of evaluation beyond the synthetic dataset created for the study.
- We furthermore recognize the opportunities in aligning or integrating our models and approach with related work.



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