GDPR-driven Change Detection in Consent and Activity Metadata

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Engaging Content
Engaging People

Trinity College Dublin
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European Union
European Regional Development Fund

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GDPR
General Data Protection Regulation

- Needs ‘valid‘ given consent
- Fines 4% of global turnover
- Record of processing activity
- Data Protection Officer to monitor compliance
- Demonstrate compliance → *Past*
- Plan & Maintain compliance → *Future*

Research
Area and Domain

- Express legal obligations → ODRL
- Infrastructure for GDPR compliance
- Metadata modeling, storing, and querying

  Provenance Metadata

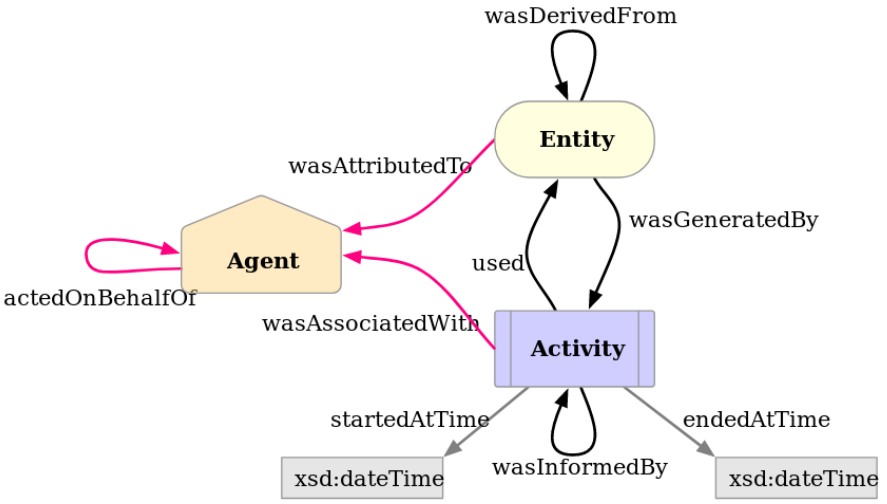
  - Activity and Entity
  - i.e. Consent and Personal Data lifecycles

State of the Art

Provenance - PROV Ontology (PROV-O)

https://www.w3.org/TR/prov-o/

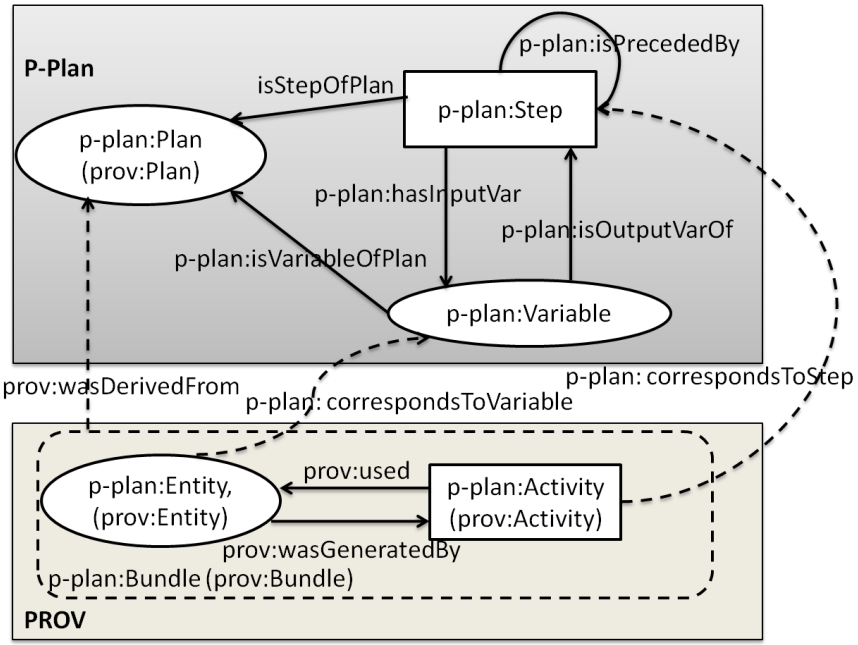
- OWL2 ontology to express provenance
- W3C Recommendation 30-APR-2013
- Interaction between Activity, Entity, Agents
- Record history *(past)*



State of the Art
Provenance - P-Plan

http://vocab.linkeddata.es/p-plan/

- Extension of PROV-O
- Represent ‘plan‘ that guided execution
- Model execution that is yet to happen *(future)*
- Common template
- Individual instantiations using PROV-O

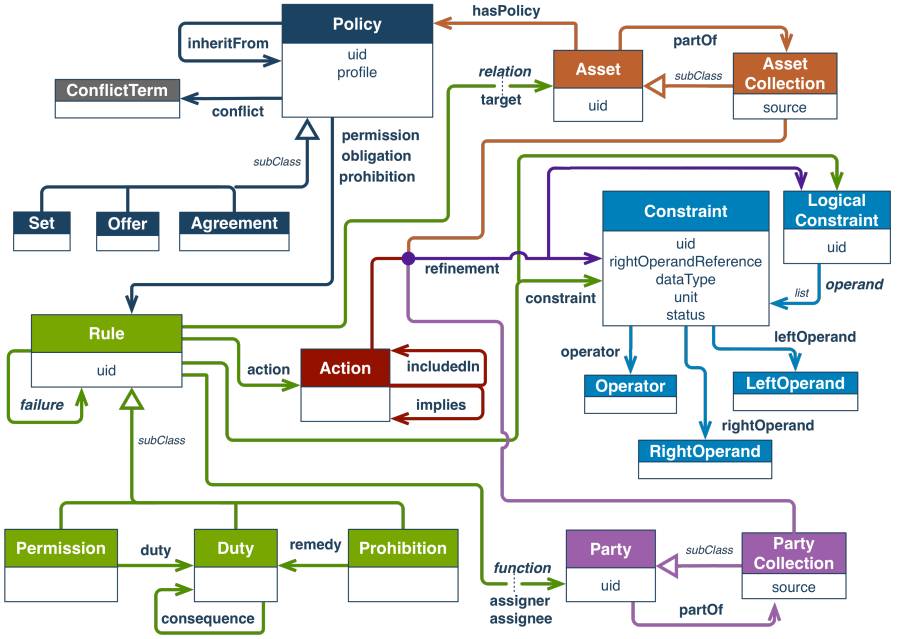


State of the Art

ODRL – Open Digital Rights Language

https://www.w3.org/TR/odrl-model/

- Policy language
- Permissions and Prohibitions
- W3C Recommendation 15th February 2018



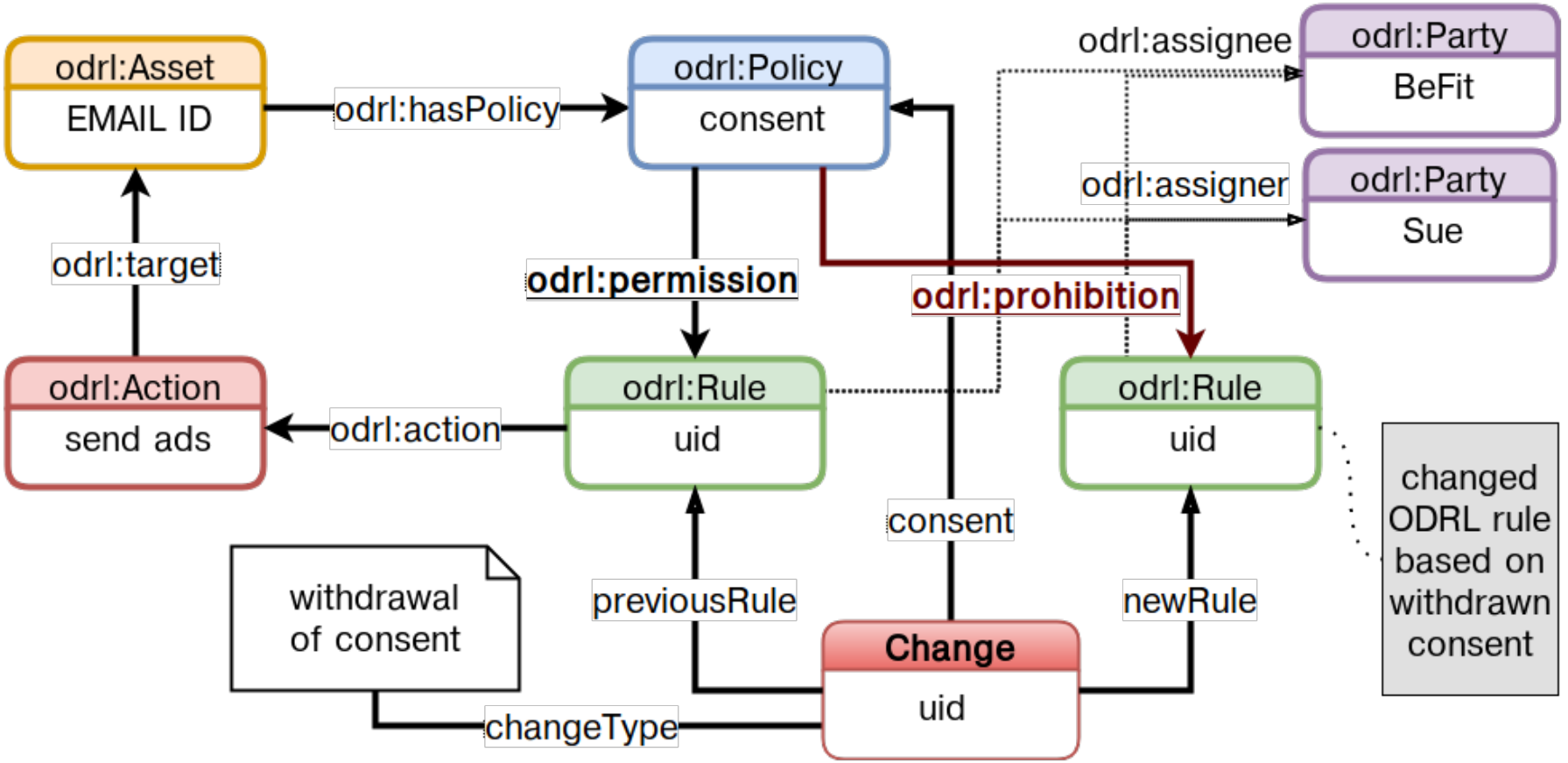
Representation of Metadata

- Consent → ODRL
  - An agreement between user and data controller or service provider
  - Express permissions and restrictions
- Provenance → P-Plan + PROV-O
  - What activities was the consent given for?
  - Express what is happening or has happened with the data

Changes in Consent

- Previously, Sue gave consent to send ads using the email address [1]
- Later, this consent was revoked
- Expressing this as ODRL, we have two objects, where the permission rules is changed to a prohibition rule

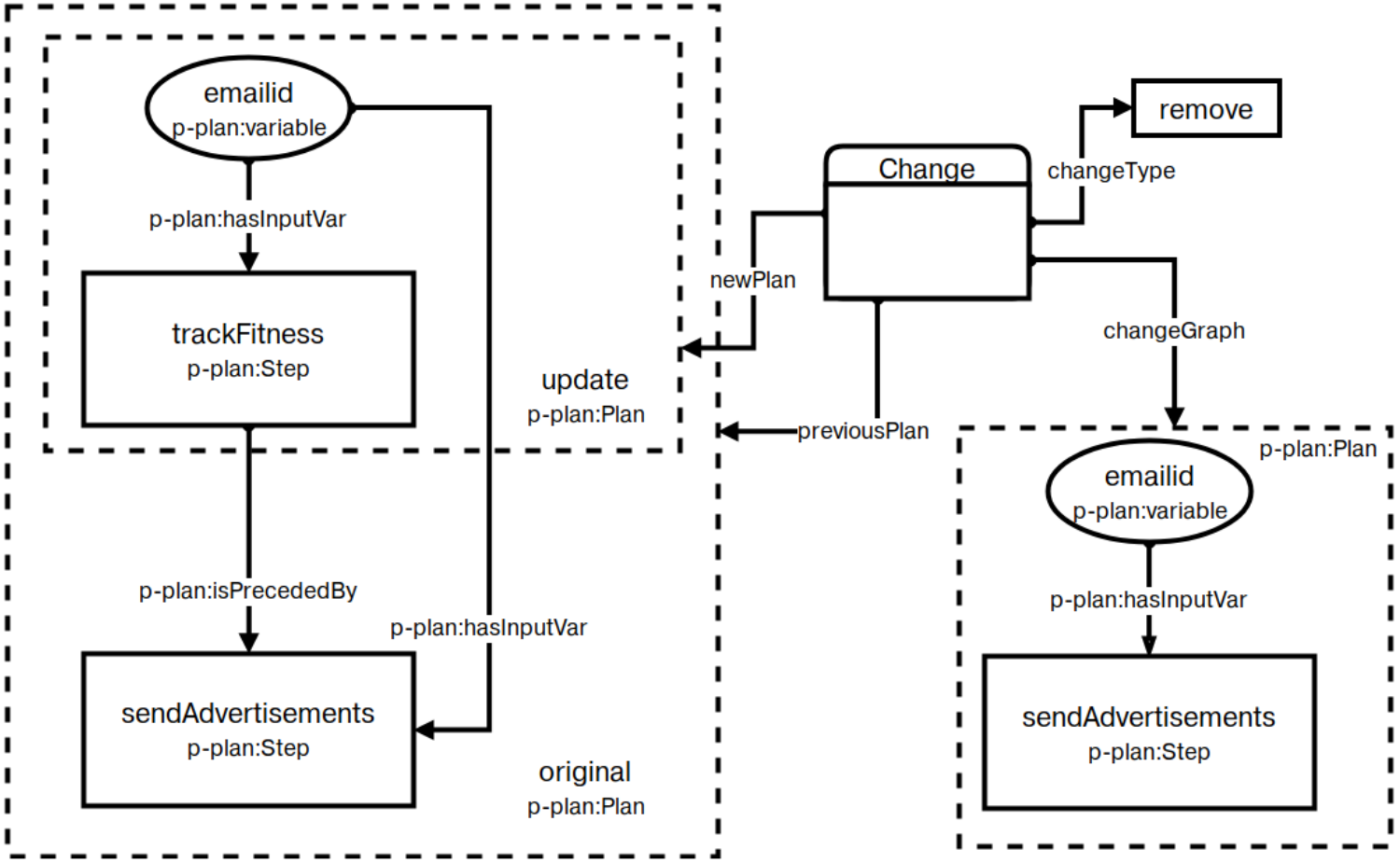
Capturing Changes in Consent



Changes in Activities

- Email is used for tracking fitness (as account)
- Later, email is also used to send ads
- This is a change in the activities where the use of email has changed, and therefore may require an updated consent (change!)
- Expressing this using P-Plan allows representing it as an abstract model

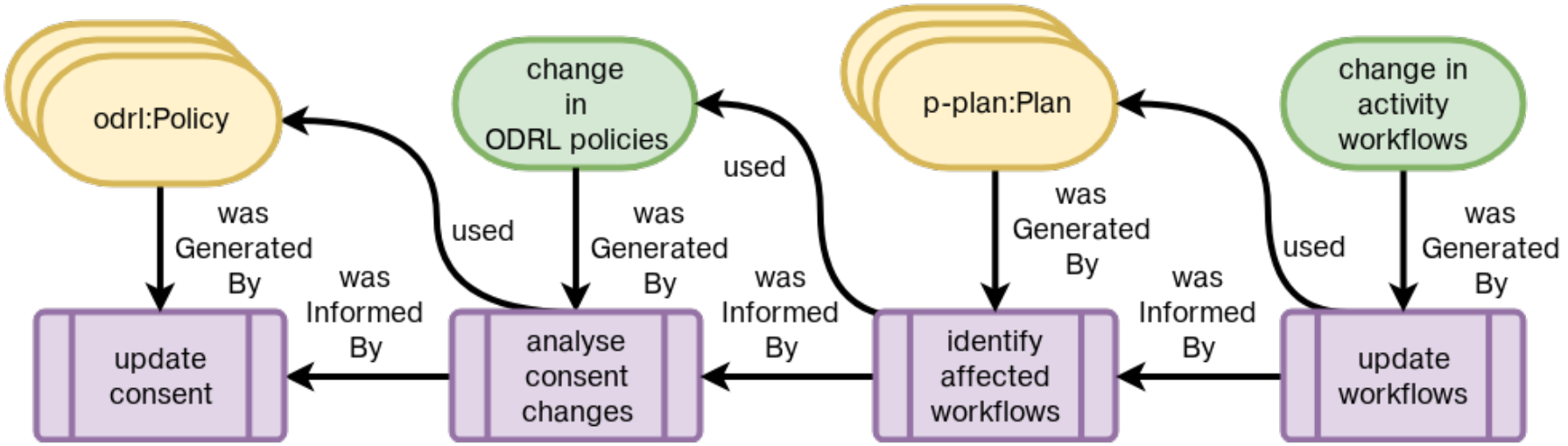
Capturing Changes in Activities



Linking Changes

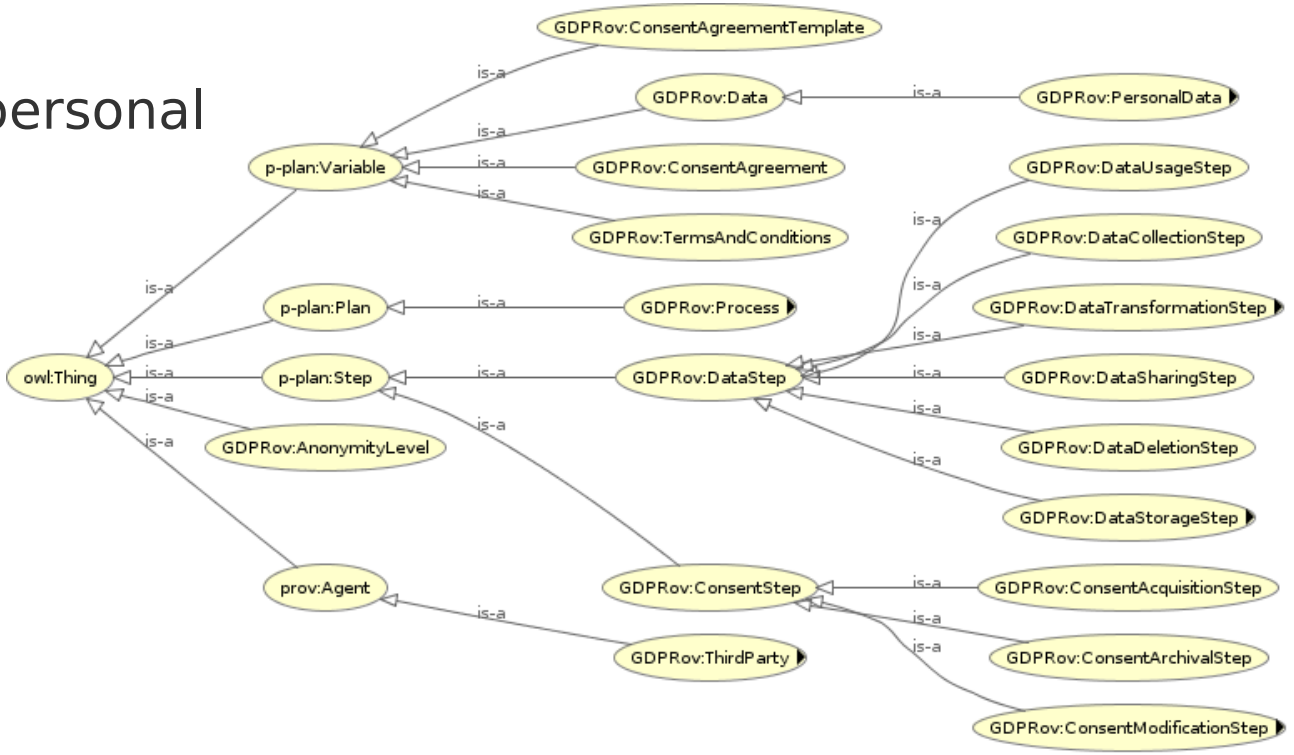
- We know that consent affects activities
- We also know that activities affects consent
- For compliance purpoes, how should this information be captured and represented?

Linking Changes using Provenance Traces



A more relevant ontology
GDPRov – GDPR Provenance Ontology

- Separation between personal data and consent activities and entities
- GDPR terminology
- Published at PrivOn workshop co-located with ISWC 2017

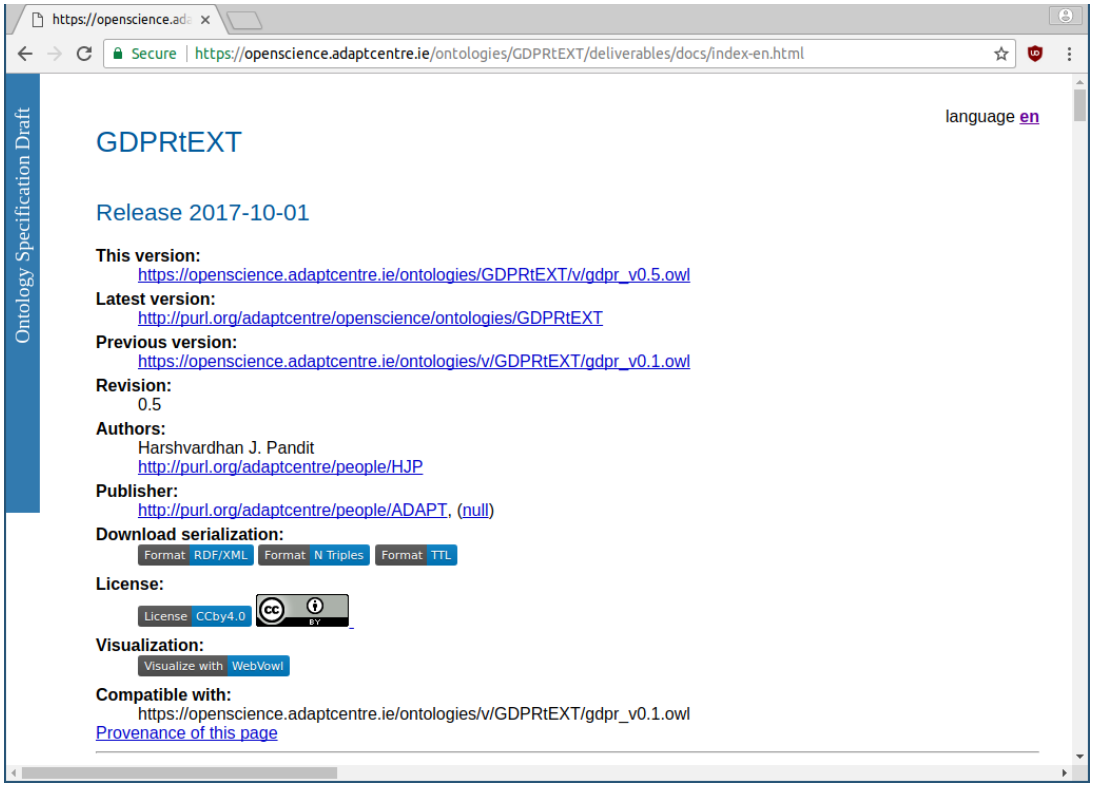


A more relevant ontology
GDPRtEXT – GDPR ontology

- Defines terms using *skos:Concept*
- Link related terms
- 200+ concepts for GDPR

- To be presented at

  ESWC2018 Resource Track



Challenges at scale

- Detect changes
- Analyse changes
- Demonstrate changes were compliant
- Reflect real-world use-cases

Fallback Solution

- If this model is not feasible at scale, can we show it working over a model of the system?
- If the model of the system is compliant, is it sufficient to say the system is compliant?
- tldr; Show changes at the model level instead of instance level

Potential Applications

- Privacy Policies on the Web
- Can we track how they change and what the change is using the approach described in this presentation?

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END OF PRESENTATION