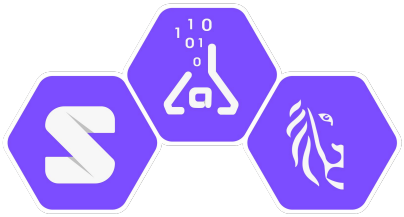


IDLab
INTERNET & DATA LAB

GHENT UNIVERSITY

imec

How to Manage My Data? With Machine-Interpretable GDPR Rights!

Beatriz Esteves, UGent – imec, BE
Harshvardhan J. Pandit, Dublin City University, IE
Georg P. Krog, Signatu AS, NO
Paul Ryan, Dublin City University & Uniphar PLC, IE

How to Manage My Data? With Machine-Interpretable GDPR Rights!

GDPR rights and their management

Related work & gaps in the literature

Towards interoperable rights management and exercising

Conclusions & future work

How to Manage My Data? With Machine-Interpretable GDPR Rights!

GDPR rights and their management

Related work & gaps in the literature

Towards interoperable rights management and exercising

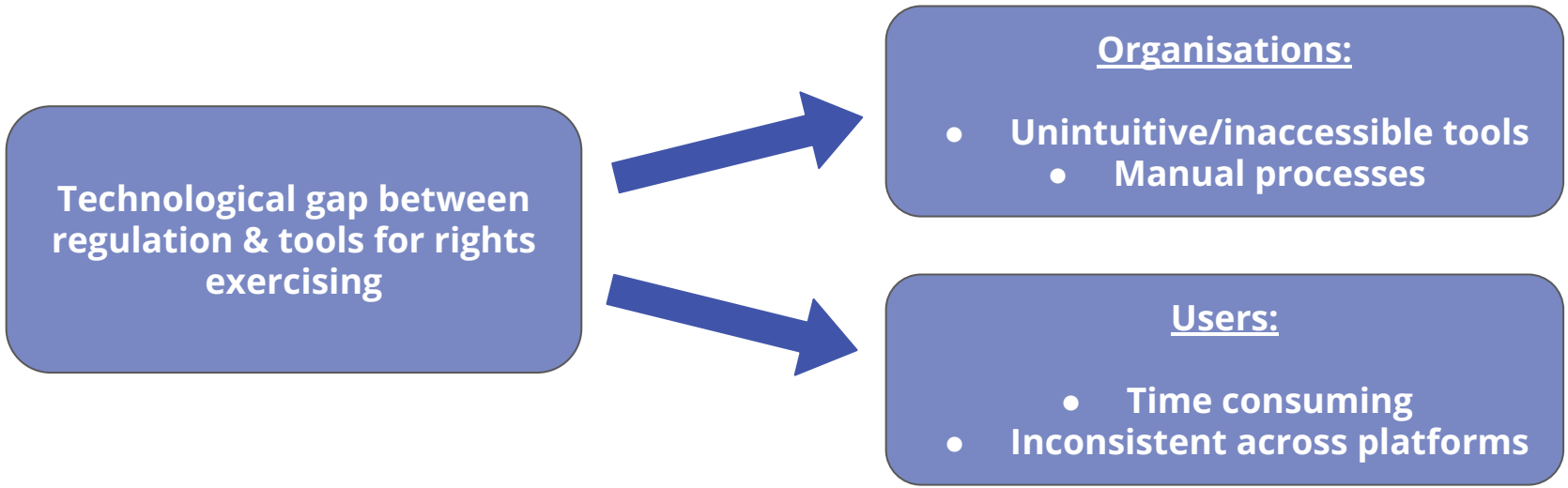
Conclusions & future work

General Data Protection Regulation (GDPR)

Extracted from medium.com, courtesy of ServeIT

How can I exercise my rights?

These rights, combined with the **transparency** and **accountability** measures imposed on organisations, aim to strike a balance between the **interests of data subjects** and the **legitimate needs of businesses and institutions** in the digital age.



How to Manage My Data? With Machine-Interpretable GDPR Rights!

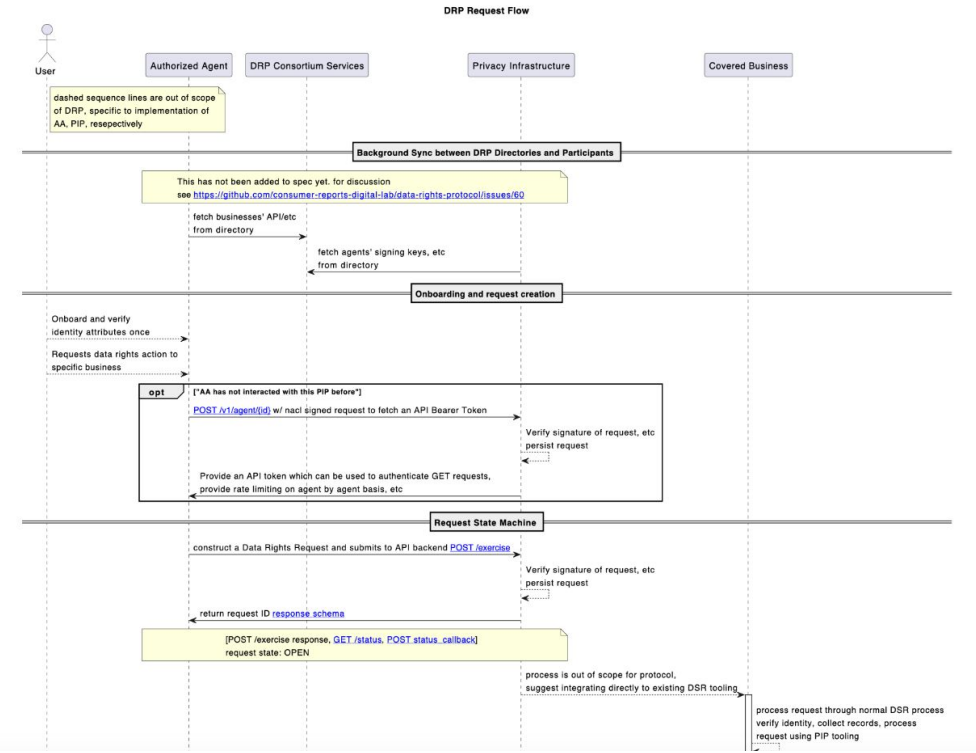
GDPR rights and their management

Related work & gaps in the literature

Towards interoperable rights management and exercising

Conclusions & future work

Data Rights Protocol



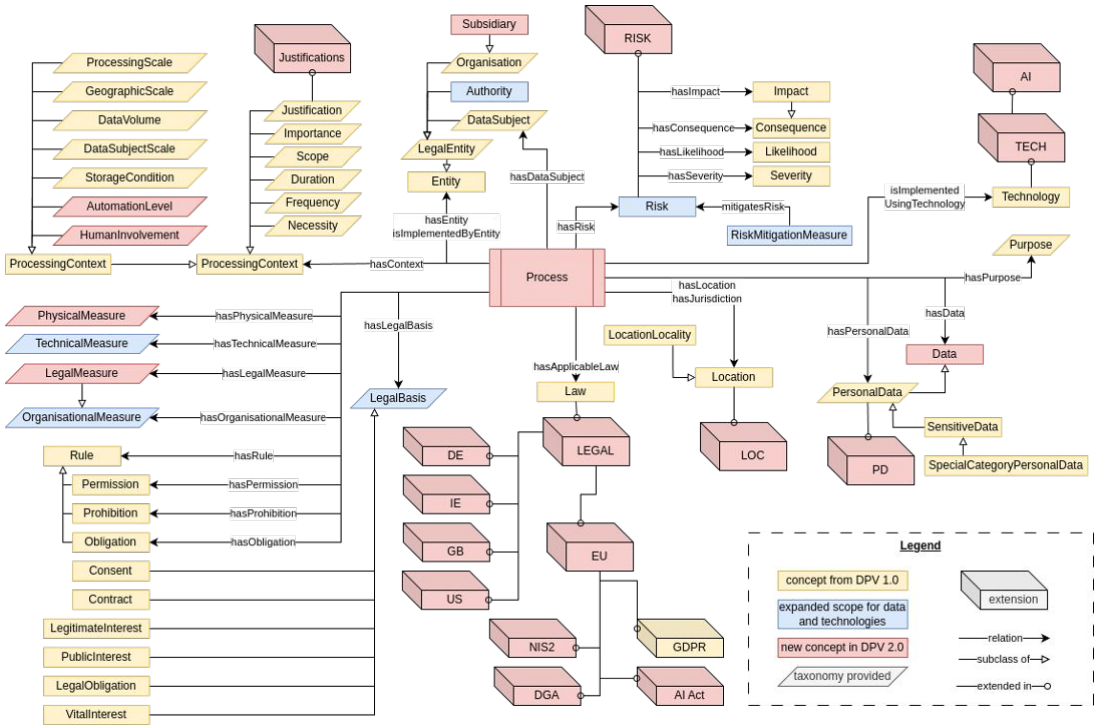
https://datarightsprotocol.org/

Based on **California Consumer Privacy Act** (CCPA) – only covers rights to :

- Opt-in/opt-out
- Delete
- Access

Lack of standard vocabularies to record information about rights being exercised

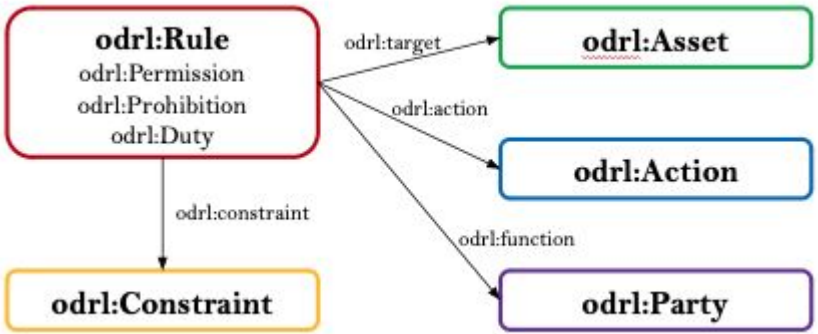
Data Privacy Vocabulary (DPV)



https://w3id.org/dpv

- Developed by the **W3C** Data Privacy Vocabularies and Controls Community Group (**DPVCG**)
- Defines a **jurisdiction-agnostic** ontology for expressing metadata about the processing of personal data
- Provides **hierarchical taxonomies**, from abstract to more specific concepts, to instantiate specific concepts in practical use-cases
- Has **law-specific extensions**

Other semantic standards



W3C Open Digital Rights Language (ODRL)

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

Data Catalog Vocabulary (DCAT) - Version 3

W3C Recommendation 22 August 2024

https://www.w3.org/TR/vocab-dcat-3/

PROV-O: The PROV Ontology

W3C Recommendation 30 April 2013

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

DublinCore

DCMI Metadata Terms

http://purl.org/dc/terms/

How to Manage My Data? With Machine-Interpretable GDPR Rights!

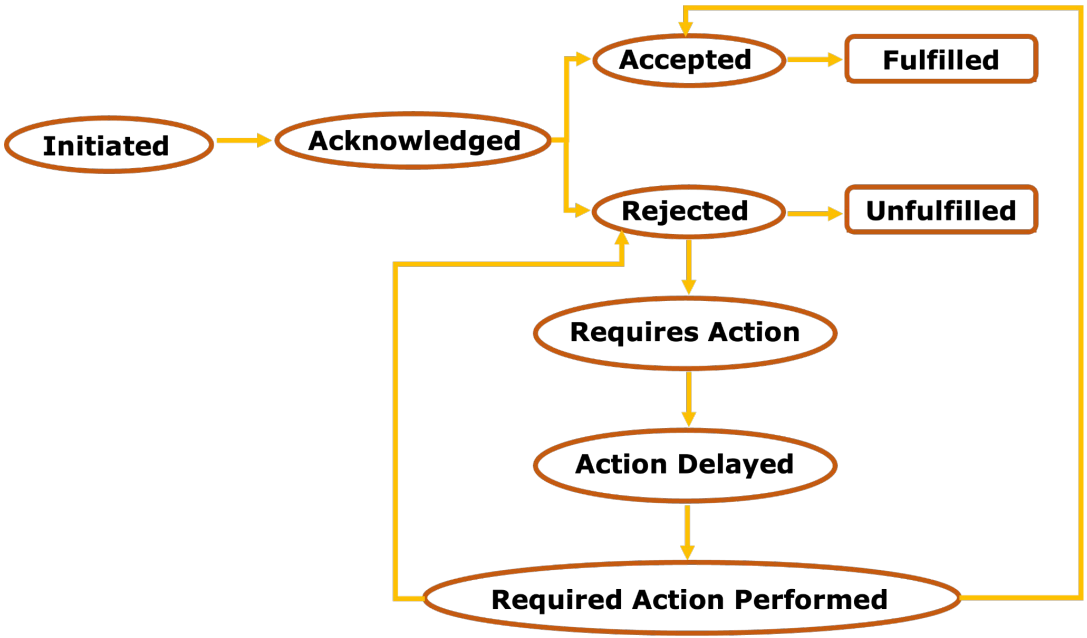
GDPR rights and their management

Related work & gaps in the literature

Towards interoperable rights management and exercising

Conclusions & future work

Rights exercise and management



1) Linking personal data processing activities to applicable rights
2) Providing notices related to said rights
3) Documenting activities related to the exercise of rights
4) GDPR rights as executable requests

http://w3id.org/people/besteves/rights

Processing activities & rights

```
ex:ProcessEmailForServiceProvision a dpv:Process ;
    dpv:hasDataController ex:DataController ;
    dpv:hasPersonalData pd:EmailAddress ;
    dpv:hasProcessing dpv:Use ;
    dpv:hasPurpose dpv:ServiceProvision ;
    dpv:hasScope [
        dpv:hasLegalBasis eu-gdpr:A6-1-a ;
        dpv:hasJurisdiction loc:EU ;
        dpv:hasApplicableLaw legal-eu:law-GDPR ;
        dpv:hasRight eu-gdpr:A7-3, eu-gdpr:A13, eu-gdpr:A14, eu-gdpr:A15, eu-gdpr:A16,
            eu-gdpr:A17, eu-gdpr:A18, eu-gdpr:A20, eu-gdpr:A22, eu-gdpr:A77 ] ;
    dpv:hasScope [
        dpv:hasLegalBasis ex:GB-GDPR-consent ;
        dpv:hasJurisdiction loc:GB ;
        dpv:hasApplicableLaw legal-gb:law-GDPR, legal-gb:law-DPA ;
        dpv:hasRight ex:RightOfAccess ] . # not complete, other rights exist

ex:DataController a dpv:DataController .

ex:RightOfAccess a dpv:Right ; skos:broader dpv:DataSubjectRight ;
    dcterms:description "Right of access to personal data" ;
    dpv:hasApplicableLaw legal-gb:law-GDPR .

ex:GB-GDPR-consent a dpv:LegalBasis ; skos:broader dpv:Consent ;
    dcterms:description "Consent given by the data subject" ;
    dpv:hasApplicableLaw legal-gb:law-GDPR .
```

Notices

```
ex:RejectRightToErasure a dpv:RightNonFulfilmentNotice ;
    dcterms:issued "2024-09-06"^^xsd:date ;
    dcterms:description "Notice of non-fulfillment related to an exercised right to erasure" ;
    dcterms:identifier "x4ghyun-658393" ;
    dcterms:language "EN" ;
    dcterms:publisher ex:DataController ;
    dpv:hasRight eu-gdpr:A17 ;
    dpv:hasDataController ex:DataController ;
    dpv:isImplementedByEntity ex:DataController ;
    foaf:page <https://example.org/DataController/RejectRightToErasure> ;
    dpv:hasRecipient ex:DataSubject ;
    dpv:hasStatus dpv:RequestUnfulfilled ;
    dpv:hasJustification justifications:FreedomOfExpressionImpaired .

ex:DataSubject a dpv:DataSubject .
```

State of the art 'Justifications' taxonomy with 62 terms

Vs

8 terms in Data Rights Protocol

https://w3id.org/dpv/justifications

Records of activities

```
ex:catalog-001 a dpv:RightExerciseRecord, dcat:Catalog ;
    dcterms:description "Record maintained by the data controller for a data subject's
    ↪  rights-related requests" ;
    dcterms:publisher ex:DataController ;
    dcterms:created "2023-10-23T08:37:25"^^xsd:dateTime ;
    dcterms:modified "2023-11-03T08:37:25"^^xsd:dateTime ;
    dcat:record ex:DS-record ;
    dcat:catalog ex:request-001, ex:request-002 .

ex:record-001 a dcat:CatalogRecord ;
    dcterms:description "Metadata about catalog-001" ;
    foaf:primaryTopic ex:DataSubject ;
    dcterms:publisher ex:DataController ;
    dpv:hasDataController ex:DataController ;
    dpv:hasDataSubject ex:DataSubject ;
    dcterms:issued "2023-10-23T08:37:25"^^xsd:dateTime .

ex:request-001 a dpv:RightExerciseRecord, dcat:Catalog ;
    dcterms:description "Record maintained by the data controller for a GDPR Art.15 request" ;
    dcterms:created "2023-10-23T08:37:25"^^xsd:dateTime ;
    dcterms:modified "2023-10-25T08:37:25"^^xsd:dateTime ;
    dpv:hasRight eu-gdpr:A15 ;
    dpv:hasStatus dpv:RequestFulfilled ;
    dcat:resource ex:SARequest, ex:SARAcknowledged, ex:SARRejected, ex:SARRequiresAction,
        ex:SARActionDelayed, ex:SARActionPerformed, ex:SARAccepted, ex:SARFulfilled .

ex:request-001-series a dcat:DatasetSeries ;
    dcat:first ex:SARequest ; dcat:last ex:SARFulfilled .

ex:SARAcknowledged a dpv:RightExerciseActivity, dcat:Resource ;
    dcat:inSeries ex:request-001-series ; dcat:prev ex:SARequest .
```

Rights as executable policies

```
ex:delete-request a odrl:Request ;
    odrl:uid "3456-7890-1234-5678-9012"^^xsd:string ;
    dcterms:description "Data subject requests data controller to delete their data." ;
    odrl:obligation ex:DS-delete-data ;
    odrl:obligation ex:DS-delete-notice .

ex:DS-delete-data a odrl:Duty ;
    dpv:hasRight eu-gdpr:A17 ;
    odrl:target ex:DS-data ;
    odrl:assigner ex:DataSubject ;
    odrl:assignee ex:DataController ;
    odrl:action odrl:delete ;
    odrl:constraint ex:DS-delete-justification .

ex:DS-delete-justification a odrl:Constraint ;
    odrl:leftOperand dpv:Justification ;
    odrl:operator odrl:eq ;
    odrl:rightOperand justifications:NonNecessityObjection .

ex:DS-delete-notice a odrl:Duty ;
    dpv:hasRight eu-gdpr:A19 ;
    odrl:action odrl:inform ;
    odrl:informedParty ex:DataSubject ;
    odrl:informingParty ex:DataController ;
    odrl:target ex:DS-RightsRecipientsNotice .

ex:DS-RightsRecipientsNotice a eu-gdpr:RightsRecipientsNotice .
```

How to Manage My Data? With Machine-Interpretable GDPR Rights!

GDPR rights and their management

Related work & gaps in the literature

Towards interoperable rights management and exercising

Conclusions & future work

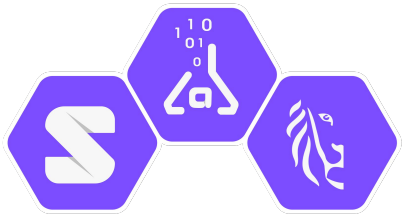
Conclusions & future work

http://w3id.org/people/besteves/rights

Machine-interpretable and executable model to represent information regarding data subject rights, concepts to **justify their fulfilment or non-fulfilment**, **notices** to communicate about them with other entities, **records** for auditing and **policies** for automated execution of responses to rights requests, based on the GDPR.

Validated by legal experts in DPV and integrated as guidance document on DPVCG's outputs.

- **Integrate with Data Rights Protocol or Advanced Data Protection Control (ADPC)**
- **Develop GDPR-compliant by design rights management infrastructure for Data Spaces and European Digital Identity (EUDI) wallets**



IDLab
INTERNET & DATA LAB

GHENT UNIVERSITY

imec

How to Manage My Data? With Machine-Interpretable GDPR Rights!

Beatriz Esteves, UGent – imec, BE
Harshvardhan J. Pandit, Dublin City University, IE
Georg P. Krog, Signatu AS, NO
Paul Ryan, Dublin City University & Uniphar PLC, IE