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

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# 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

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# General Data Protection Regulation (GDPR)

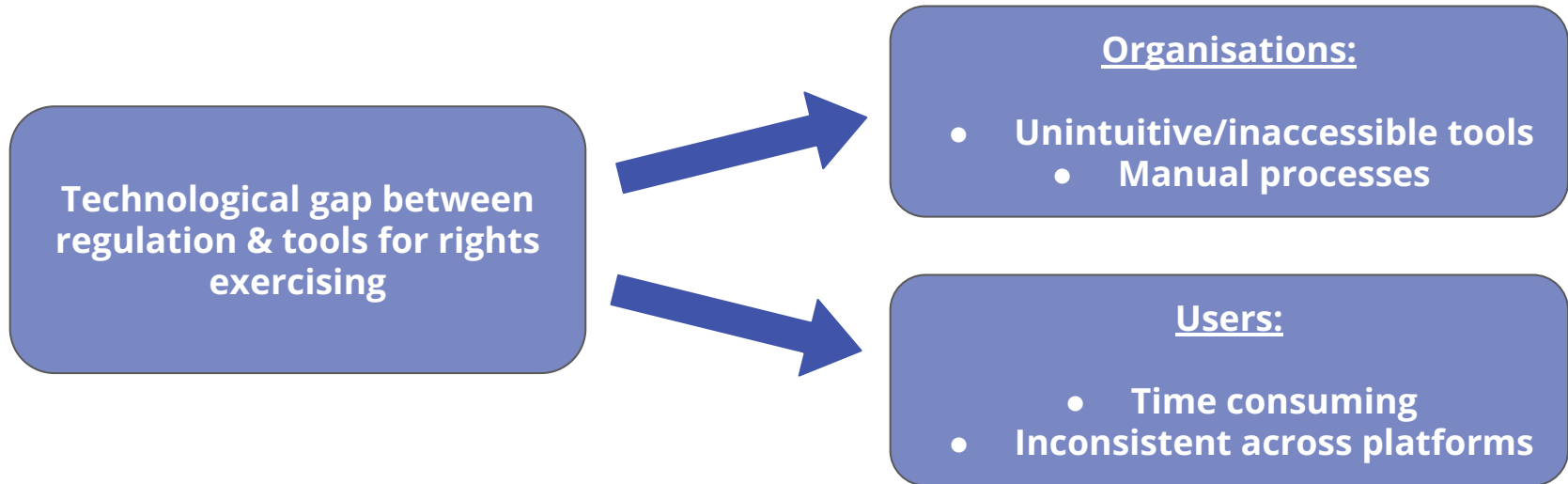


The infographic is a blue rectangular panel with eight white text boxes arranged in two columns. Each box contains an icon, a title, and a description of a GDPR right. The icons include: a green circle with a white 'i', a red door, a blue checkmark, a white stick figure dropping a coin, a red handstop sign, a yellow trolley, a white speech bubble with an exclamation mark, and a white robot head.

Icon	Right	Description
	<b>RIGHT TO BE INFORMED</b>	Be transparent in how you collect and process personal information and the purposes that you intend to use it for. Inform your customer of their rights and how to carry them out.
	<b>RIGHT OF ACCESS</b>	Your customer has the right to access their data. You need to enable this either through business process or technical means.
	<b>RIGHT TO RECTIFICATION</b>	Your customer has the right to correct information that they believe is inaccurate.
	<b>RIGHT TO ERASURE</b>	You must provide your customer with the right to be forgotten, provided that your legitimate interest to hold such information does not override theirs.
	<b>RIGHT TO RESTRICTION OF PROCESSING</b>	Your customer has the right to request that you stop processing their data.
	<b>RIGHT TO DATA PORTABILITY</b>	You need to enable the machine and human-readable export of your customers' personal information.
	<b>RIGHT TO OBJECT</b>	Your customer has the right to object to you using their data.
	<b>RIGHTS REGARDING AUTOMATED DECISION MAKING</b>	Your customer has the right not to be subject to a decision based solely on automated processing, including profiling.

# 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.



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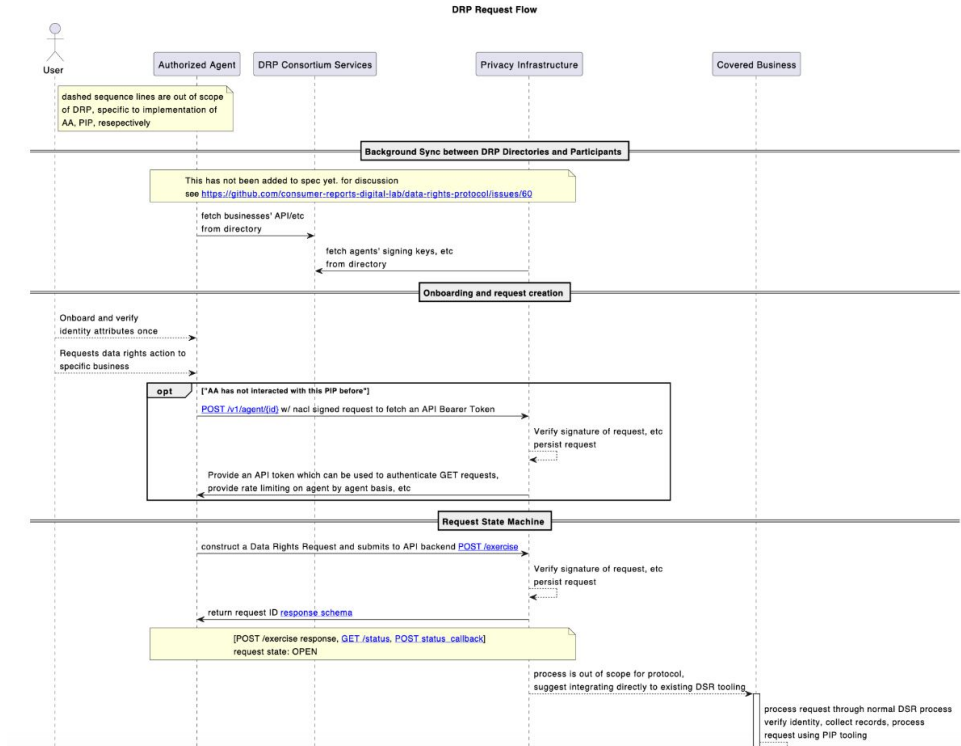
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# Data Rights Protocol

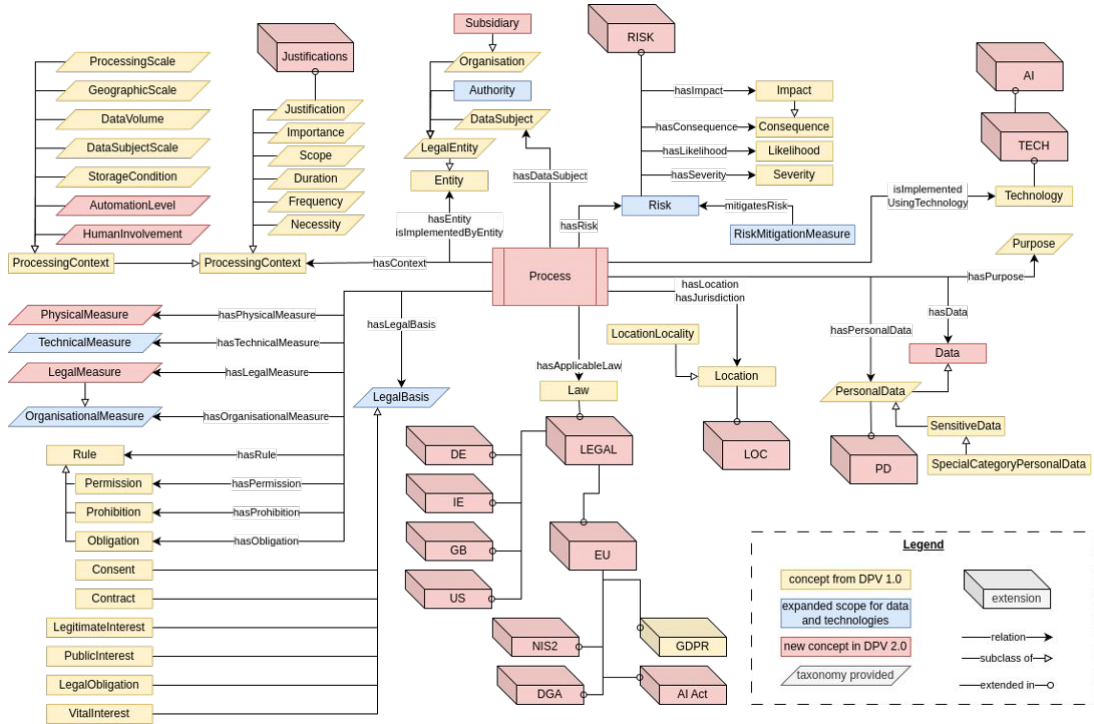


Based on **California Consumer Privacy Act (CCPA)** – only covers rights to :

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

**Lack of standard vocabularies** to record information about rights being exercised

# Data Privacy Vocabulary (DPV)

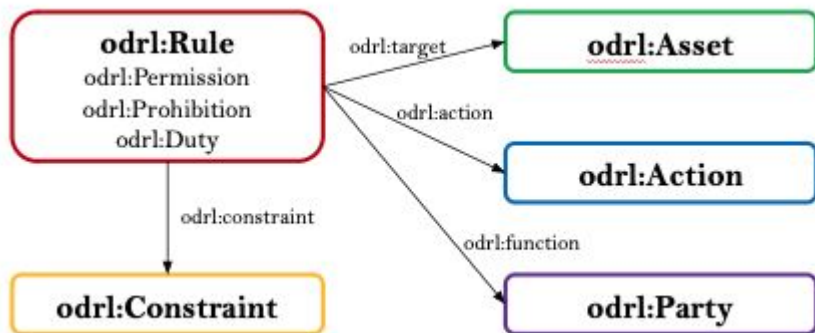


<https://w3id.org/dpv>

- 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



Who [can | cannot | must] act what  
in which resource how

**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/>

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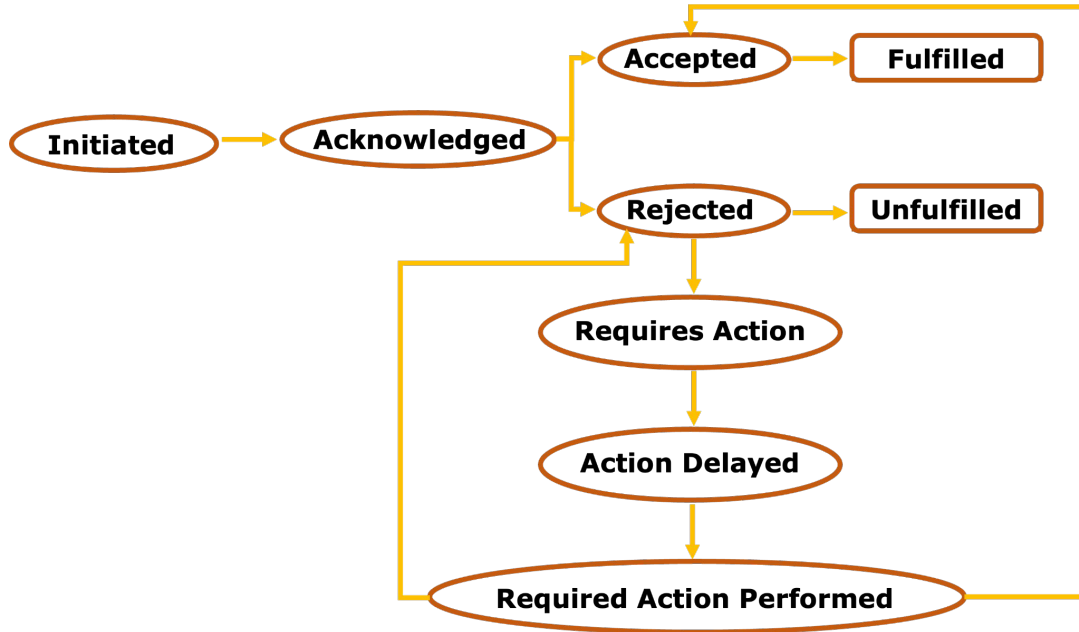
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# Rights exercise and management



- 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:SARrequest, ex:SARacknowledged, ex:SARrejected, ex:SARrequiresAction,
  ex:SARactionDelayed, ex:SARactionPerformed, ex:SARaccepted, ex:SARfulfilled .

ex:request-001-series a dcat:DatasetSeries ;
  dcat:first ex:SARrequest ; dcat:last ex:SARfulfilled .

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

# 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 .
```

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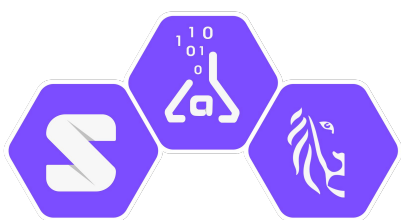
# Conclusions & future work

<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



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