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Creating A Vocabulary for Data Privacy

The First-Year Report of Data Privacy Vocabularies and Controls Community Group (DPVCG)

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DPV vocabulary: <https://w3.org/dpv>

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1. Background
2. DPVCG
3. Methodology
4. Existing & Related Work
5. Data Privacy Vocabulary
 - a) Base Ontology
 - b) Purposes
 - c) Processing
 - d) Technical & Organisational Measures
 - e) Personal Data Categories
 - f) Consent (Legal Base)
6. Future Work

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We thank all members of the W3C DPVCG for their feedback and input to this work: a preliminary outline of the goals of CG has been presented in ISWC2018's SWSG workshop [5] where we also gathered valuable feedback by the participants; this work is the first complete presentation of the resulting, proposed vocabulary elaborated by the DPVCG since.



- Laws such as GDPR (EU, 2016) & CCPA (CA, 2018) regulate processing of personal data
- Obligations and compliance requirements provide motivation for adopting technical solutions
- Momentum towards interoperable privacy solutions (e.g. ISO 27701)

However, there are still some gaps to address:

- 1) Lack of standardised vocabularies for representing
 - personal data categories (what?)
 - purposes of processing (why? & how?)
- 2) No aligned terminology within privacy laws

Problem: How to represent information about handling (or processing) of personal data in a machine-readable format for compliance with data privacy laws such as GDPR and CCPA?

- ➔ To address the issue, a W3C community group (CG) was started
“Data Privacy Vocabularies & Controls CG”
- ➔ Aim: To create vocabularies for representing personal data, purposes/processing, disclosure/consent, etc. in an interoperable format towards standardisation
- ➔ Started: 25th May 2018
- ➔ Members: 58 participants to date
- ➔ Deliverable of work done till date:

Data Privacy Vocabulary

<http://w3.org/ns/dpv>



<https://www.w3.org/community/dpvcg/>

Public Mailing List

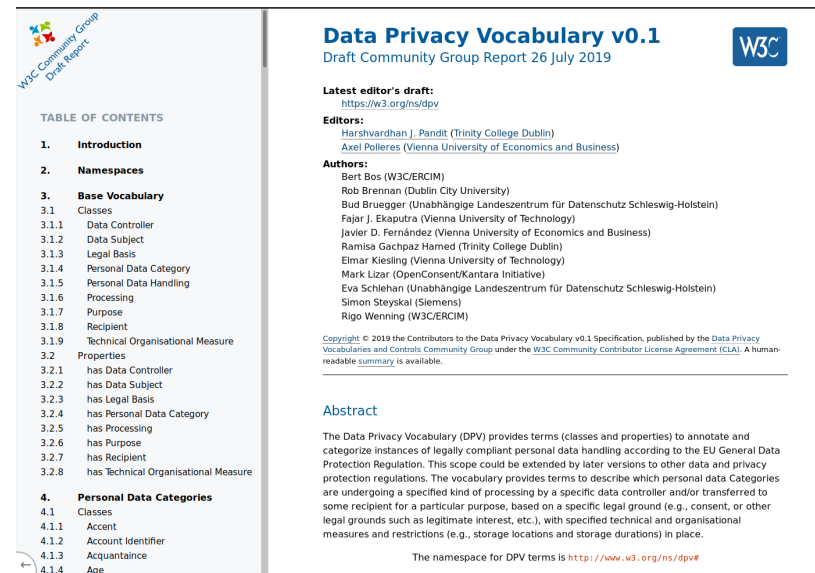
<https://lists.w3.org/Archives/Public/public-dpvcg/>

Creating A Vocabulary for Data Privacy - ODBASE 2019 by Pandit, Polleres, et al.

Data Privacy Vocabulary <http://w3.org/ns/dpv>

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- Modular vocabulary for representing *personal data handling*
- Represented as an ontology using OWL2
- Published: 26th July 2019
- Models:
 - 1) Personal Data Categories
 - 2) Purposes
 - 3) Processing Categories
 - 4) Technical & Organisational Measures
 - 5) Legal Basis
 - 6) Consent
 - 7) Recipients, Data Controllers, Data Subjects



Data Privacy Vocabulary v0.1
Draft Community Group Report 26 July 2019

Latest editor's draft:
<https://w3.org/ns/dpv>

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Copyright: © 2019 the Contributors to the Data Privacy Vocabulary v0.1 Specification, published by the Data Privacy Vocabulary and Controls Community Group under the W3C Community Contributor License Agreement (CLA). A human-readable summary is available.

Abstract
The Data Privacy Vocabulary (DPV) provides terms (classes and properties) to annotate and categorize instances of legally compliant personal data handling according to the EU General Data Protection Regulation. This scope could be extended by later versions to other data and privacy protection regulations. The vocabulary provides terms to describe which personal data Categories are undergoing a specified kind of processing by a specific data controller and/or transferred to some recipient for a particular purpose, based on a specific legal ground (e.g., consent, or other legal grounds such as legitimate interest, etc.), with specified technical and organisational measures and restrictions (e.g., storage locations and storage durations) in place.

The namespace for DPV terms is <http://www.w3.org/ns/dpv>

Link: <http://w3.org/ns/dpv>

GDPR Legal Basis Vocabulary
<https://www.w3.org/ns/dpv-gdpr>



- (informally based) NeOn methodology for ontology development [28]
- Decision to create top-level hierarchy of concepts
- Analysis of existing and relevant work for reuse
- Use of OWL for expressing relations and logic
- Base Vocabulary adopted from SPECIAL Usage Policy [6]
- Terms were proposed/resolved using spreadsheet in Google Sheets
- Documentation generated using W3C ReSpec
- Repo on Github
- Discussions via F2F and public mailing list

| Column Name | Description | Representation |
|--------------------------|--------------------------------|---------------------------------|
| Class/Property | If term is Class or Property | <i>rdfs:Class/rdfs:Property</i> |
| term | The IRI of the term | as IRI |
| description | Description or definition | <i>dct:description</i> |
| domain | Domain if it is a property | <i>rdfs:domain</i> |
| range | Range if it is a property | <i>rdfs:range</i> |
| super classes/properties | Parent classes or properties | <i>rdfs:isSubClassOf</i> |
| sub classes/properties | Child classes or properties | N/A |
| related terms | Terms relevant to this | <i>rdfs:seeAlso</i> |
| how related? | Nature of relation | use as is |
| comments | Comments used for discussion | N/A |
| source | The source of the term | <i>rdfs:isDefinedBy</i> |
| date | Date of creation | <i>dct:created</i> |
| status | Status e.g. accepted, proposed | <i>sw:term_status</i> |
| comments | Comments to be recorded | <i>rdfs:comment</i> |
| contributor | dc:creator | <i>dct:creator</i> |
| date-accepted | Date of acceptance | <i>dct:date-accepted</i> |
| resolution | Record e.g. minutes of meeting | as IRI |

[6] Bonatti, P.A., Kirrane, S., Petrova, I.M., Sauro, L., Schlehahn, E.: The SPECIAL Usage Policy Language, V0.1. Tech. rep. (2018), <https://www.specialprivacy.eu/vocabs>

[28] Suárez-Figueroa, M.C., Gómez-Pérez, A., Fernández-López, M.: The NeOn Methodology for Ontology Engineering. In: Suárez-Figueroa, M.C., Gómez-Pérez, A., Motta, E., Gangemi, A. (eds.) *Ontology Engineering in a Networked World*, pp. 9–34. Springer Berlin Heidelberg, Berlin, Heidelberg (2012). https://doi.org/10.1007/978-3-642-24794-1_2, http://link.springer.com/10.1007/978-3-642-24794-1_2

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Data Privacy Vocabulary <http://w3.org/ns/dpv>

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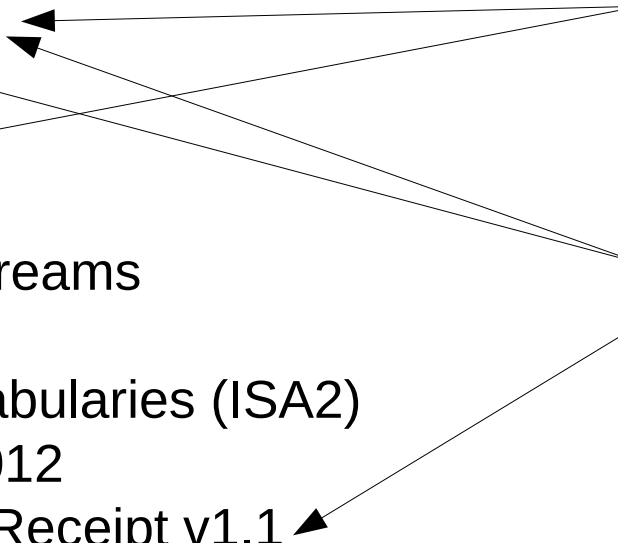
- 1) Document using Wiki https://www.w3.org/community/dpvcg/wiki/Main_Page
- 2) Identify relevant concepts and relationships in vocabularies

Standards

- PROV-O
- P-Plan
- ODRL
- vCard
- ActivityStreams
- COEL
- CoreVocabularies (ISA2)
- IEEE P7012
- Consent Receipt v1.1
- P3P

Vocabularies

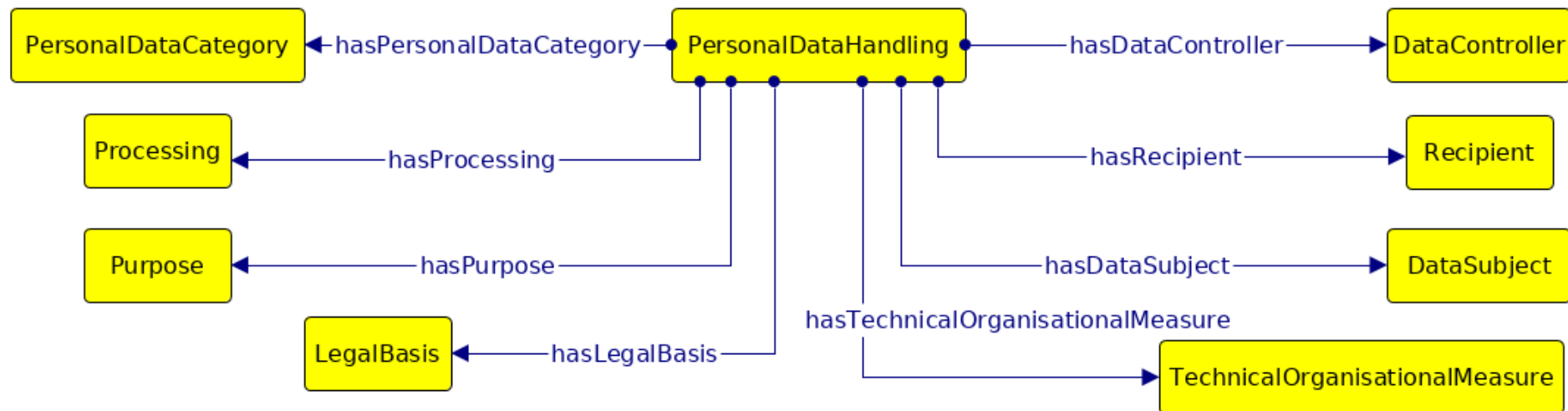
- SPECIAL project
- MIREL project
- DAPRECO project
- GDPRtEXT
- GDPRov
- GConsent
- Privacy Preference Ontology (PPO)



Reasons for not reusing concepts:

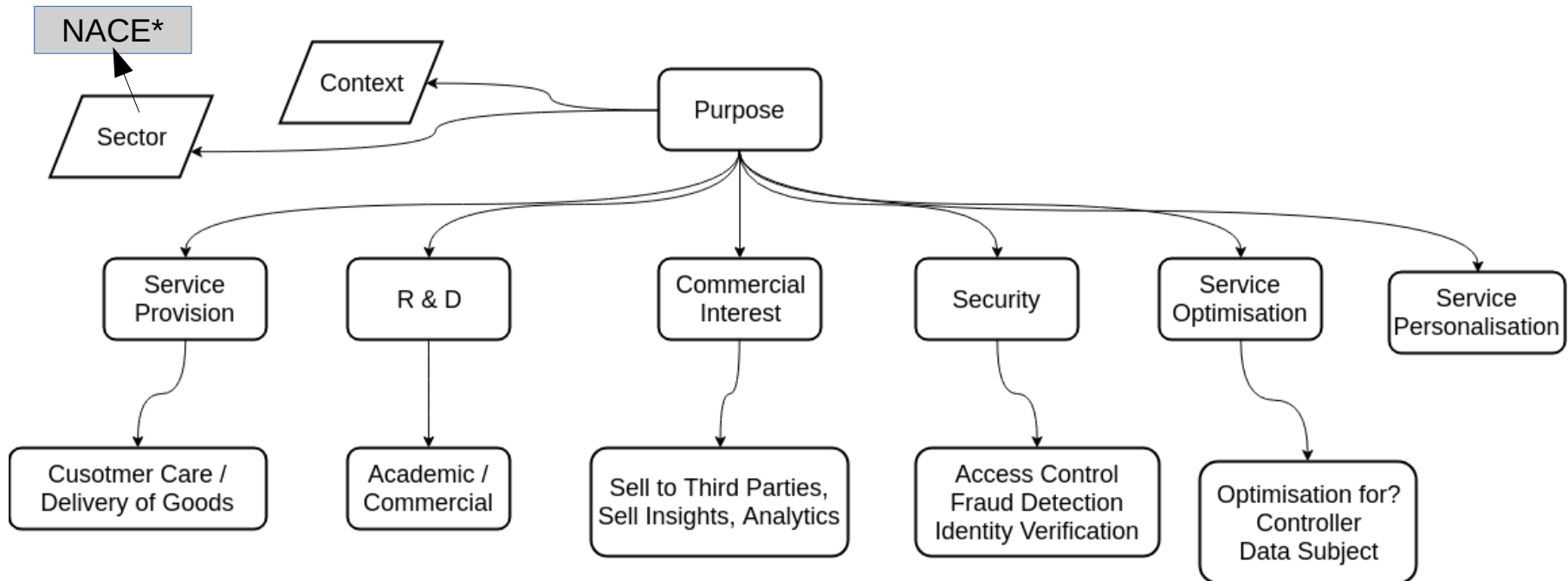
- × Importing all external semantics into DPV
- × Choice of OWL2 was made at a later stage of development
- × Not all concepts matched or fit in together

- Top-level classes defining a policy for legal personal data handling
- Represented by class ***PersonalDataHandling***
- Connects different modular components




```
:SomePurpose a dpv:Purpose ;  
  rdfs:label "Some Purpose" ;  
  dpv:hasSector dpv-nace:M72 .
```

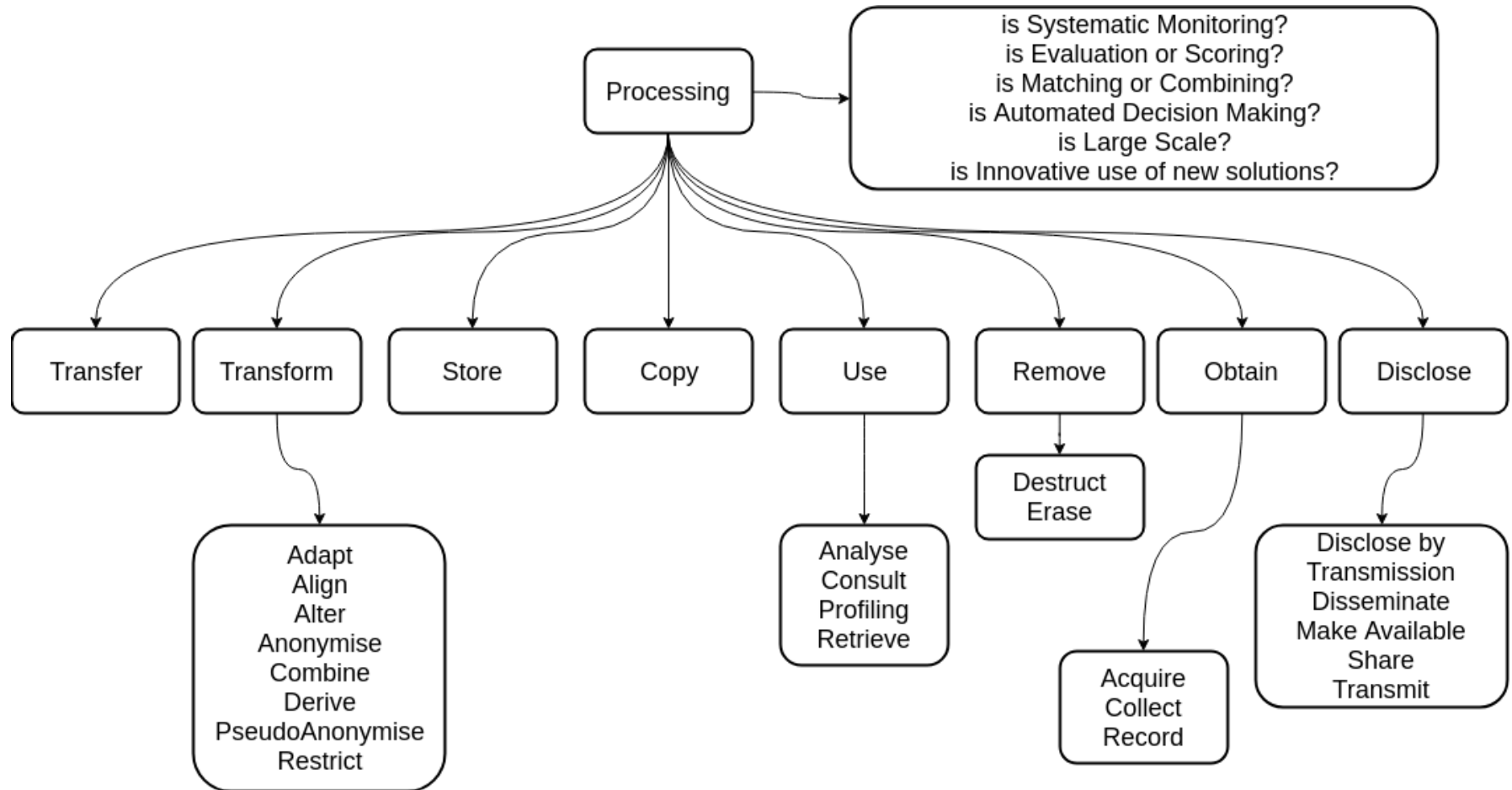
Top-level categorisation of purposes



```
:NewPurpose  
  rdfs:subClassOf dpv:DeliveryOfGoods, dpv:FraudPreventionAndDetection ;  
  rdfs:label "New Purpose" ;  
  rdfs:comment "Intended delivery of goods with fraud prevention" .
```

* RDFS representation of NACE <https://github.com/dpvcg/dpv-nace>

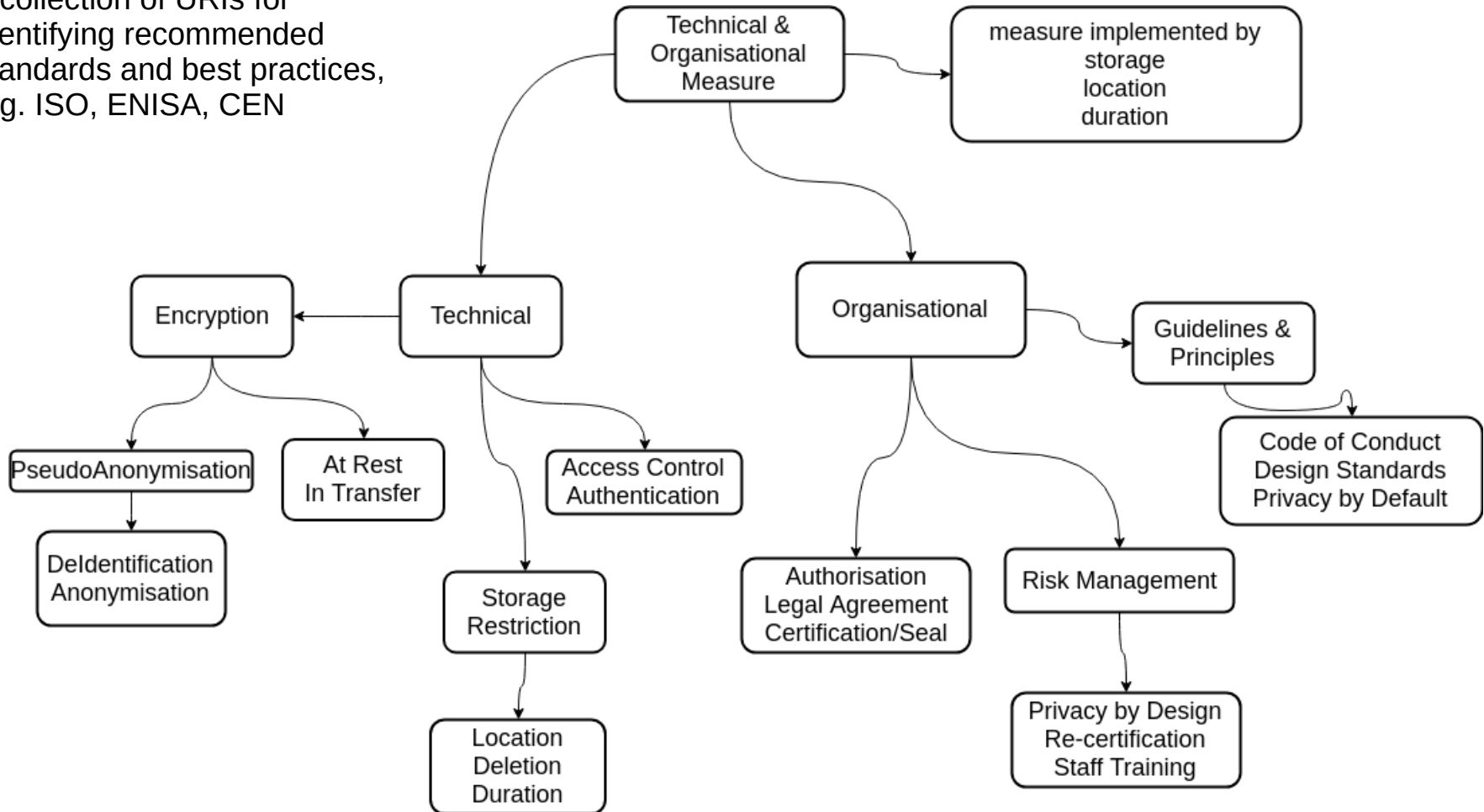
Hierarchy of Processing Categories



DPV – Technical & Organisational Measures

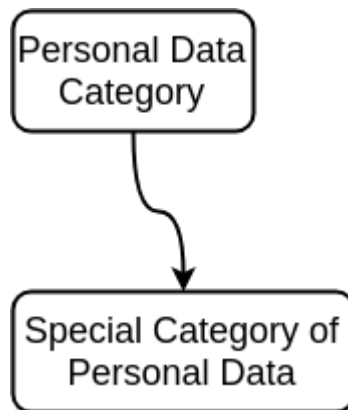


In the future, we plan to provide a collection of URIs for identifying recommended standards and best practices, e.g. ISO, ENISA, CEN





- Utilise taxonomy provided by Enterprivacy
- Extend for identified use-cases
- Add required classes e.g. Special Categories or Sensitive Categories



```

:PresentationsLiked
  rdfs:subClassOf dpv:Like ;
  rdfs:label "Presentations Liked" .
  
```

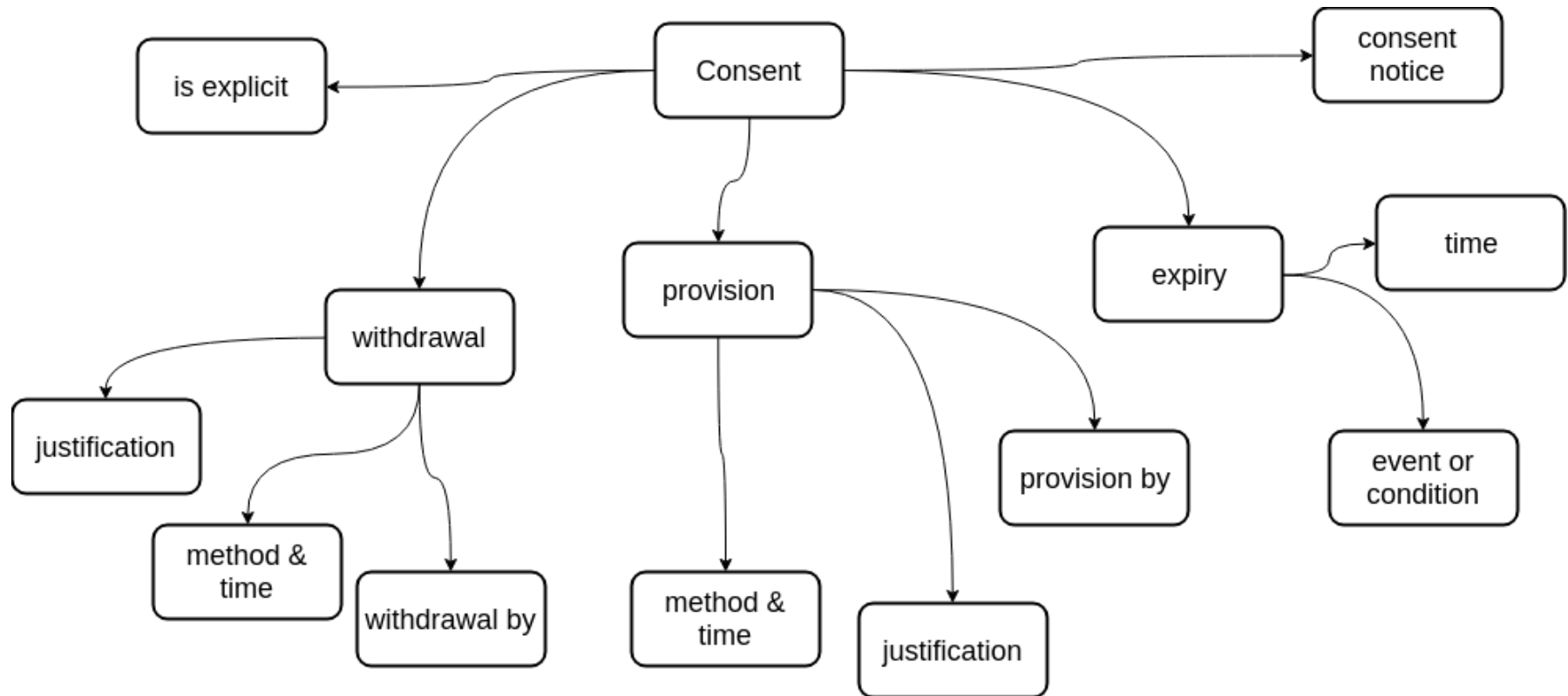
Like → Interest → Preference → Internal



Provided by Enterprivacy Consulting Group

<https://enterprivacy.com>

Attributes required to demonstrate given consent satisfies all legal requirements – based on Consent Receipt v1.1 standard





- ‘Primer Document’: non-technical introduction to DPV
- Use-Cases and Examples documentation for adoption
- Open & ongoing feedback/suggestion
 - Github Issues / Pull-Requests
 - Public Mailing Lists
- Agreement towards v1 ‘stable’ vocabulary
- Provide JSON-LD fragments for adoption on Web
- Resolve open issues

<https://www.w3.org/community/dpvcg/track/issues/open>

Invitation to join and participate!



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~ end of presentation ~

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