



The W3C Data Privacy Vocabularies and Controls Community Group (DPVCG) proudly presents...

Data Privacy Vocabulary



https://w3id.org/dpv

Harshvardhan J. Pandit

ADAPT Centre, Dublin City University, Dublin, Ireland me@harshp.com

Beatriz Esteves

IDLab, Ghent University - imec, Ghent, Belgium beatriz.esteves@ugent.be

Georg P. Krog

Signatu AS, Oslo, Norway georg@signatu.com

Paul Ryan

ADAPT Centre, Dublin City University, and Uniphar PLC, Dublin, Ireland paul.ryan76@mail.dcu.ie

Delaram Golpayegani

ADAPT Centre, Trinity College Dublin, Dublin, Ireland delaram.golpayegani@adaptcentre.ie

Julian Flake

University of Koblenz, Koblenz, Germany flake@uni-koblenz.de

Presented at







Why do we need 'Legal Metadata' ???



You need it to express processes and control them at a granular level





You need it to model documents and information like contracts

You need it to enable user agents for *humans* to manage decisions



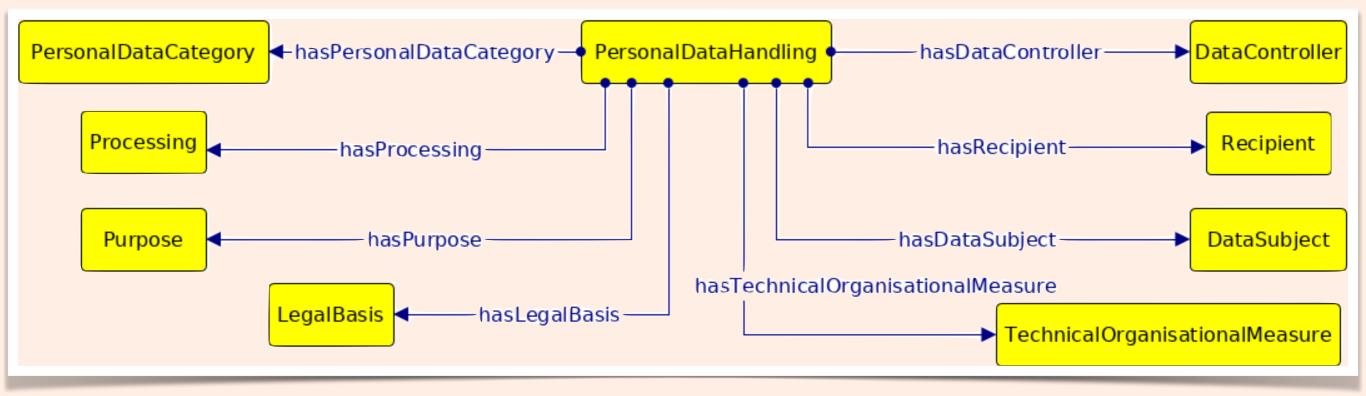
And of course you need it to manage legal compliance



The SPECIAL project launched the W3C Data Privacy Vocabularies and Controls Community Group (DVPCG) to develop a community that can create and maintain such legal metadata, based on EU GDPR

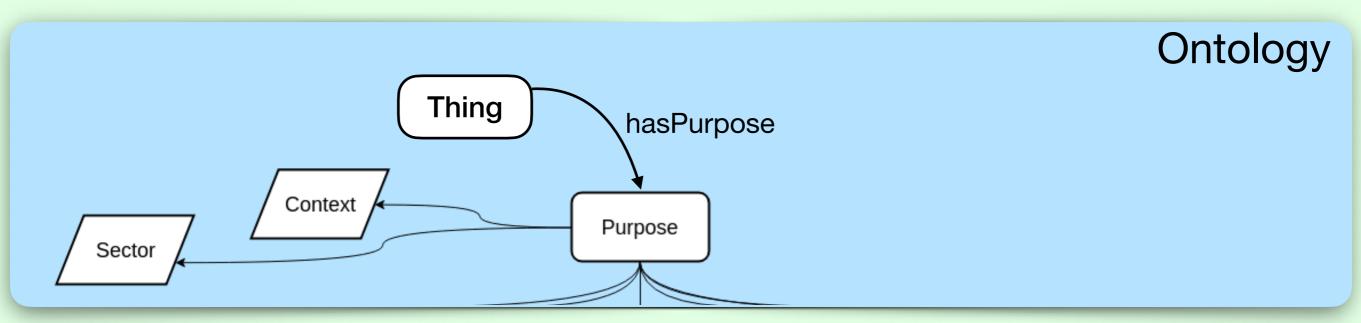
The DPVCG quickly attracted ontologists, computer scientists, lawyers, authorities, NGOs, academics, industry stakeholders, students, researchers, and basically formed a melting pot of expertise.

'Data Privacy Vocabulary' (DPV)

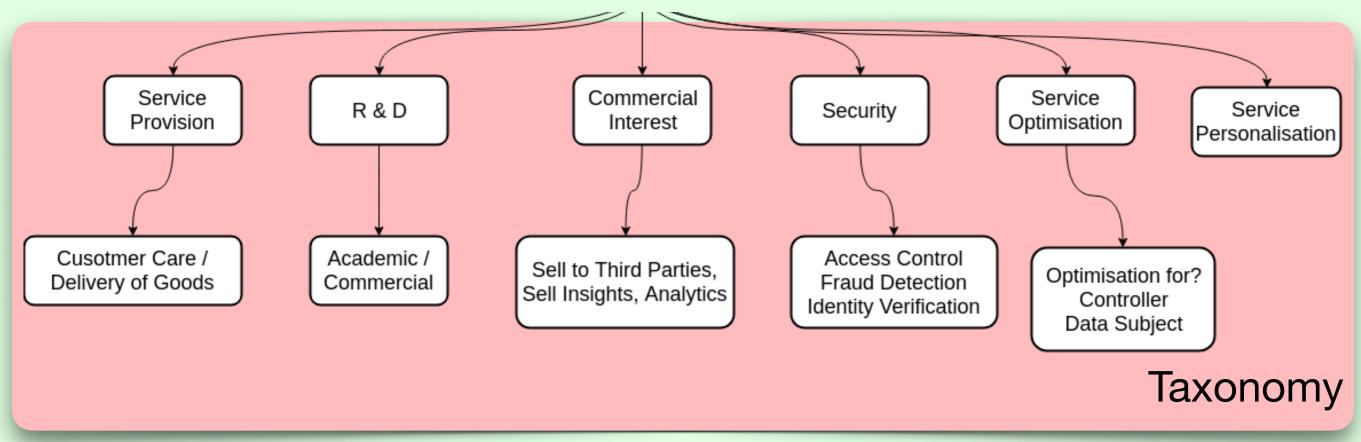


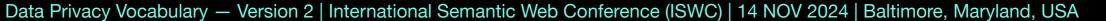
The DPVCG created the Data Privacy Vocabulary to provide an 'ontological model' for personal data being processed, and a 'taxonomical vocabulary' to support its effective use in practical settings.

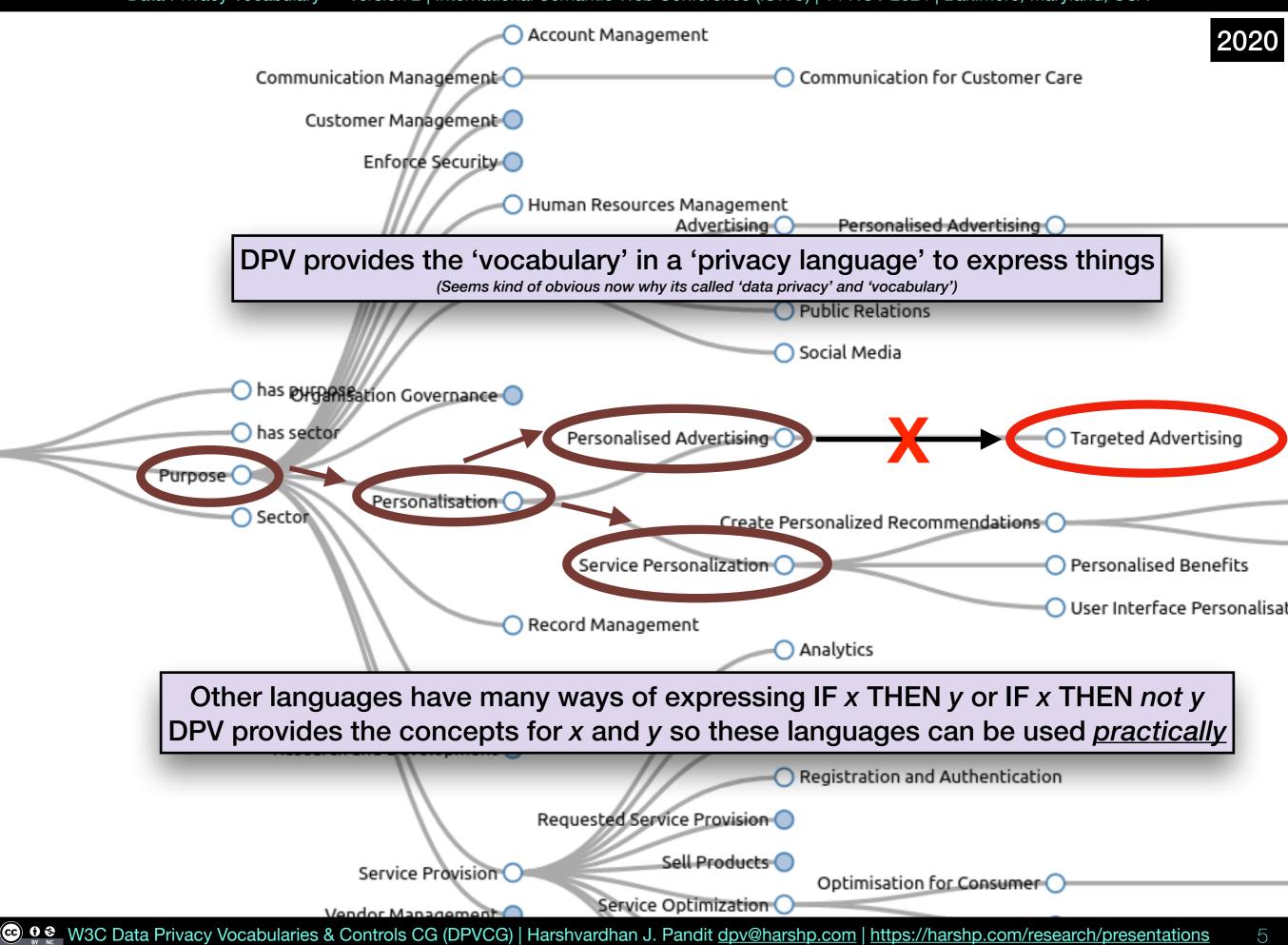
2019



To put it simply, DPV is a two layered approach to create an 'ontology' for modelling the domain (T-box) and providing taxonomies to express use-cases in the domain (A-box)

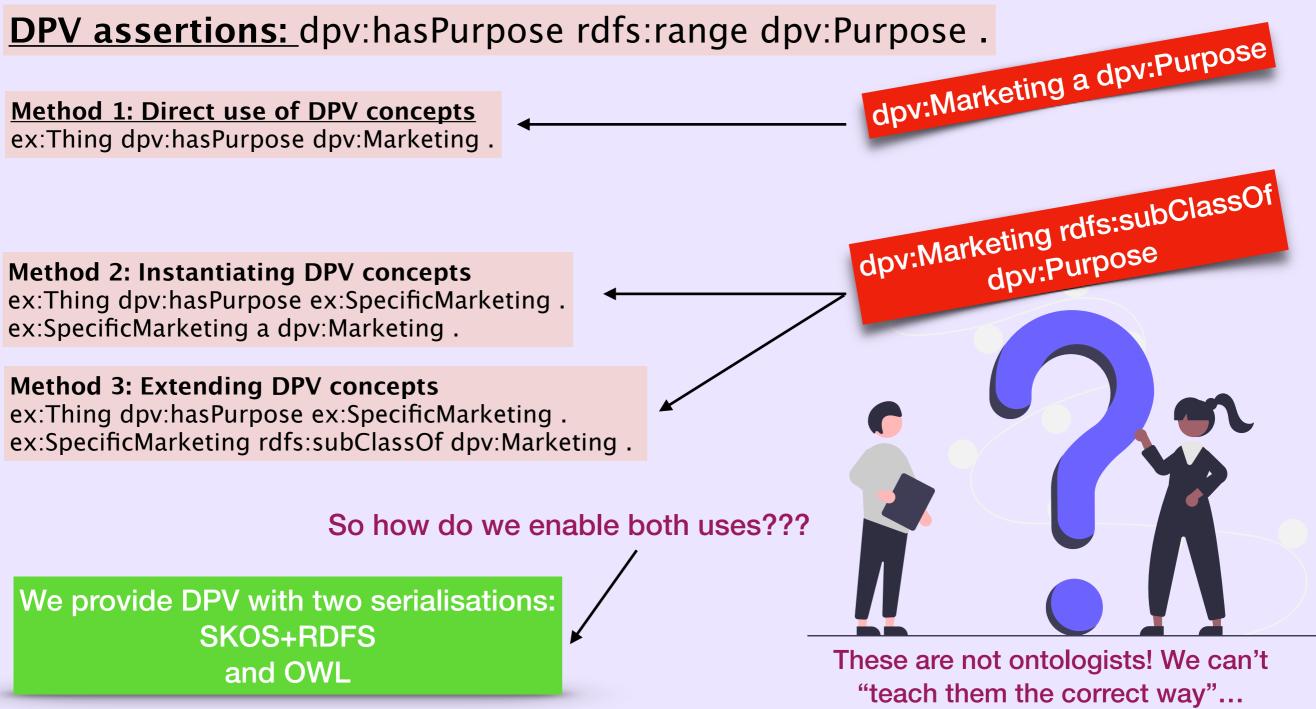


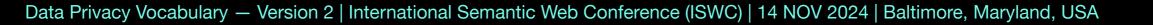


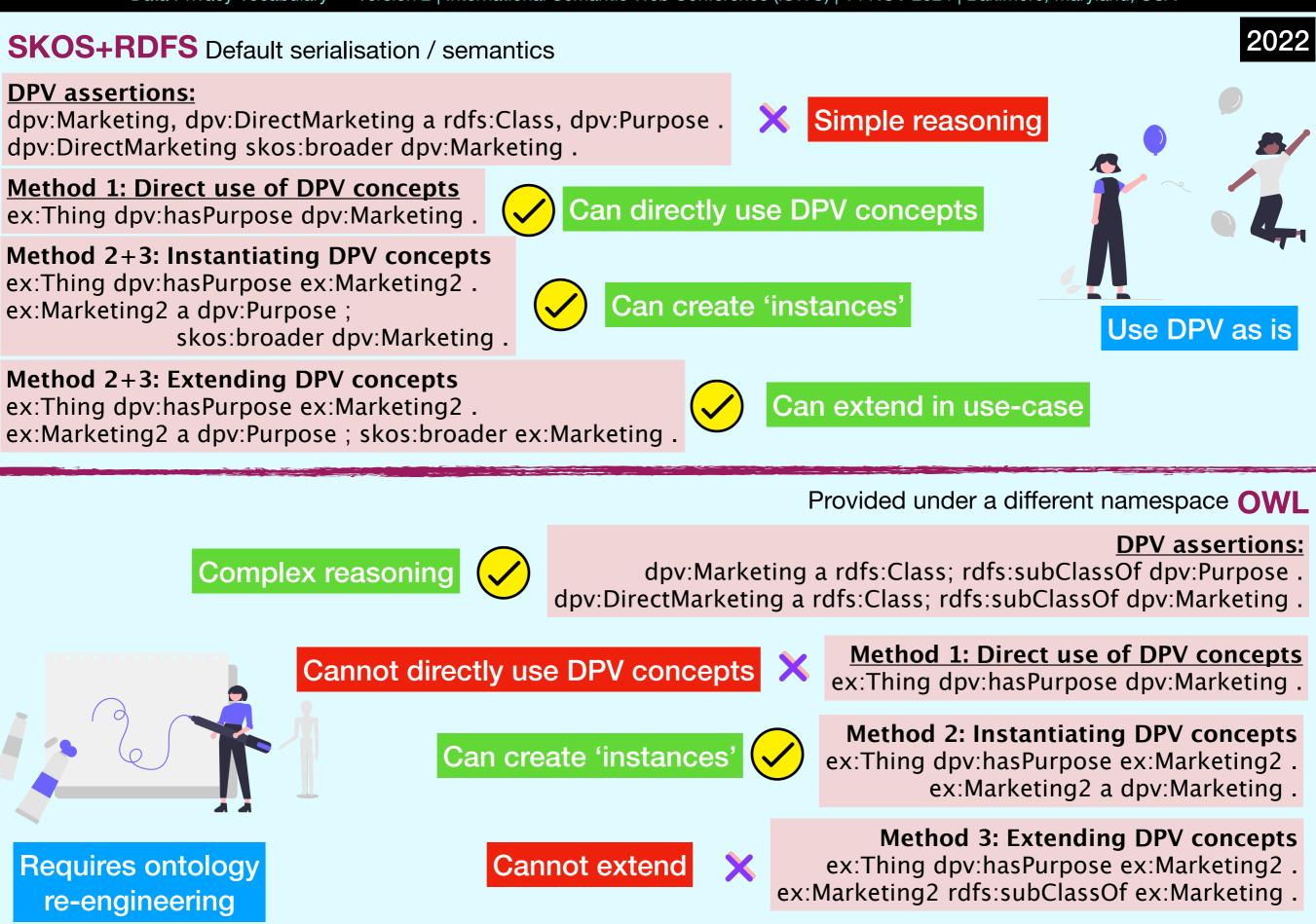


Data Privacy vocabulary – version 2 International Semantic Web Co	merence (ISWC) 14 NOV 2024 Bailimore, Maryland, USA
Data Privacy Vocabulary (DPV)	2022
version 1	Approx. ~2100 'hand-crafted' concepts;
Final Community Group Report 05 December 2022	DPV-GDPR: GDPR Extension for DPV
This version: https://www.w3.org/community/reports/dpvcg/CG-FINAL-dpv-20221205/	version 1
Latest published version: https://w3id.org/dpv	Modelled GDPR specific concepts in a
Latest editor's draft: https://w3id.org/dpv/ed/dpv	separate namespace
Editor: <u>Harshvardhan J. Pandit</u> (ADAPT Centre, Dublin City University)	DPV-PD: Extended Personal Data categories for DPV
Former editor:	
Axel Polleres (Vienna University of Economics and Business) - Until 31 December 2019	Extensive taxonomy of personal data
Authors:	categories for use with DPV concepts
Axel Polleres (Vienna University of Economics and Business)	categories for ace mar Brit concepte
Beatriz Esteves (Universidad Politécnica de Madrid)	DDV/IECAL, Extension providing lurisdictions
Bert Bos (W3C/ERCIM) Bud Bruegger (Unabhängige Landeszentrum für Datenschutz Schleswig-Holstein)	DPV-LEGAL: Extension providing Jurisdictions,
Elmar Kiesling (Vienna University of Technology)	Laws, and Authorities for DPV
Eva Schlehahn (Unabhängige Landeszentrum für Datenschutz Schleswig-Holstein)	version 0.8.2
David Hickey (Dublin City University)	DDAET concepto representing lowe
Fajar J. Ekaputra (Vienna University of Technology)	DRAFT concepts representing laws,
Georg P. Krog (Signatu AS)	authorities, inter-country agreements
Harshvardhan J. Pandit (ADAPT Centre, Dublin City University)	
Javier D. Fernández (Vienna University of Economics and Business)	DPV-TECH: Extension providing Technology
Julian Flake (University of Koblenz-Landau)	
Mark Lizar (OpenConsent/Kantara Initiative)	concepts for DPV
Paul Ryan (Uniphar PLC)	version 0.8.2
Piero Bonatti (Università di Napoli Federico II)	
Ramisa Gachpaz Hamed (Trinity College Dublin)	DRAFT concepts representing provision
Rigo Wenning (W3C/ERCIM)	methods, stakeholders, networking
Rob Brennan (University College Dublin)	
Simon Steyskal (Siemens)	









🚾 🖸 🗞 W3C Data Privacy Vocabularies & Controls CG (DPVCG) | Harshvardhan J. Pandit <u>dpv@harshp.com | https://harshp.com/research/presentations</u> 8



New laws adopted ... How to use DPV for those?

Laws are scoped to a particular

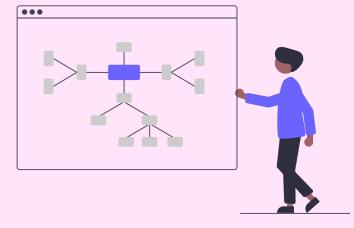
jurisdiction. How to model different

laws across different jurisdictions?



Some laws address personal and nonpersonal data. Some address technologies using personal data.





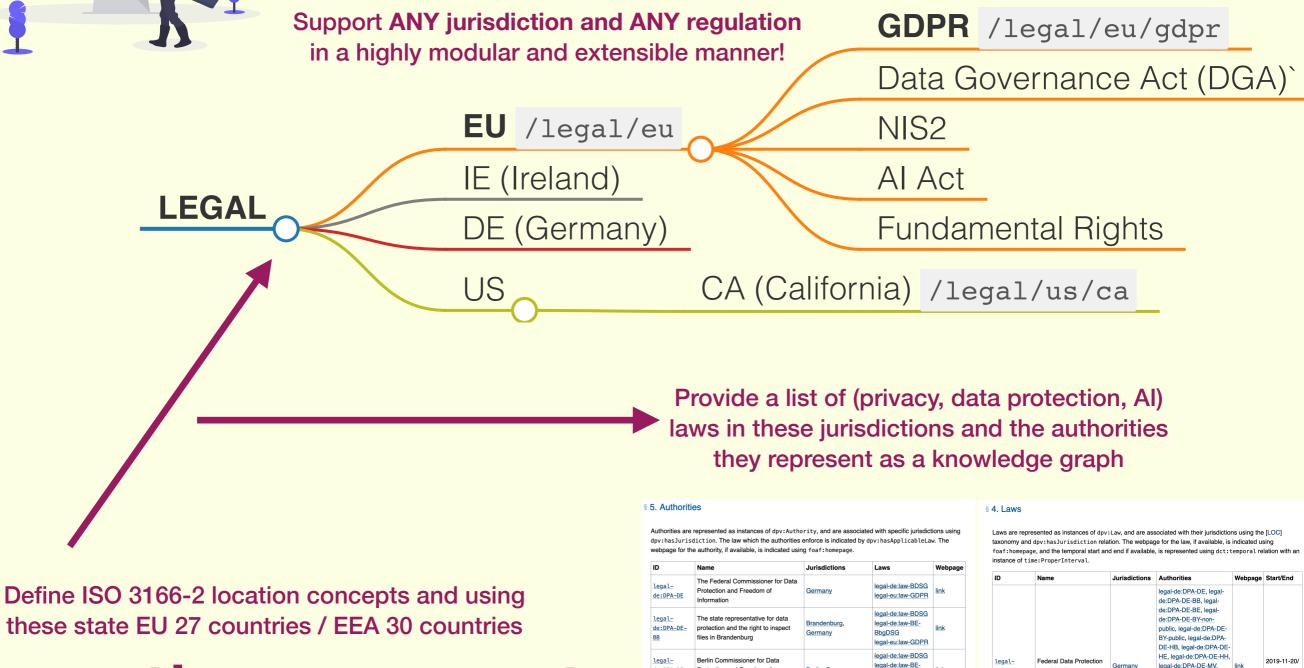
Organisations need practical stuff like risk management and security reporting



Need of the hour: Artificial Intelligence (AI) technologies - how do we represent these same concepts like purpose, data, security for AI? Data Privacy Vocabulary - Version 2 | International Semantic Web Conference (ISWC) | 14 NOV 2024 | Baltimore, Maryland, USA



Modular Legal Namespaces



Protection and Freedom of

de:DPA-DE-

Location concepts

10

ongoing

legal-de:DPA-DE-NI,

legal-de:DPA-DE-NV legal-de-DPA-DE-RE egal-de:DPA-DE-SH legal-de:DPA-DE-SL egal-de:DPA-DE-SN legal-de:DPA-DE-ST. egal-de:DPA-DE-Th

de: law-BDSG Act (BDSG)

BInDSG

egal-eu:law-GDPF

Risk Management

7. risk:Damage: Impact that acts as or cause:

a. risk:CorruptionData: Corruption of Da

b. risk:DamageByThirdParty: Damage

c. risk:DataBreach: Data Breach go to ful

d. risk:EquipmentFailure: Equipment Failure

e. risk:FinancialLoss: Financial Loss go

f. risk:Harm: Impact that acts as or caus

1. risk:AbusiveContentUtilisation:

2. risk:AttackonPrivateLife: Attack

3. risk:Blackmail: Blackmail go to ful

4. risk:ChildViolence: Child Violence

5. risk:Coercion: Coercion go to full (

6. risk:CompromiseAccount: Com

7. risk:CompromiseAccountCrede

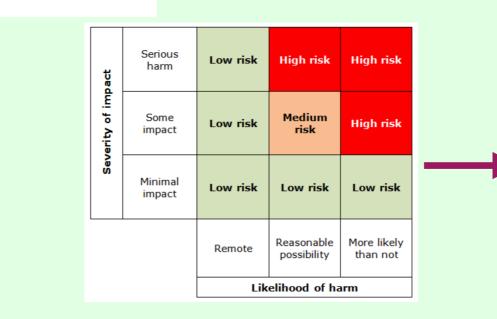
8. risk:DangertoCustomers: Dange

9. risk:DangertoPersonnel: Dange

10. risk:Discrimination: Discriminati

Risk / Impact taxonomy

- 1. risk:IncidentStatus: Status associate
 - a. risk:IncidentConcluded: The in mitigation and with a low likelihoe
 - b. risk:IncidentHalted: The incider go to full definition
 - c. risk:IncidentMitigated: The inci been applied to prevent the same
 - d. **risk:IncidentNearMiss**: The state very close" <u>go to full definition</u>
 - e. risk:IncidentOngoing: The incid



ISO 31000 series risk concepts Risk Level = Severity x Likelihood

Legal Requirements /

Statuses for representing incidents Document security incident, data breaches Indicate what data was affected, how

ex:IN12 a risk:Incident ; dpv:hasPersonalData pd:EmailAddress ; dpv:hasTechnicalMeasure dpv:Encryption # Expressing duration using method 1: D dpv:hasDuration [a dpv:UntilEventDuration ; dct:description "Incident continued u]; # Expressing duration using method 2: D dct:temporal "2023-05-24/2023-05-26" ;

dpv:hasStatus risk:IncidentConcluded .

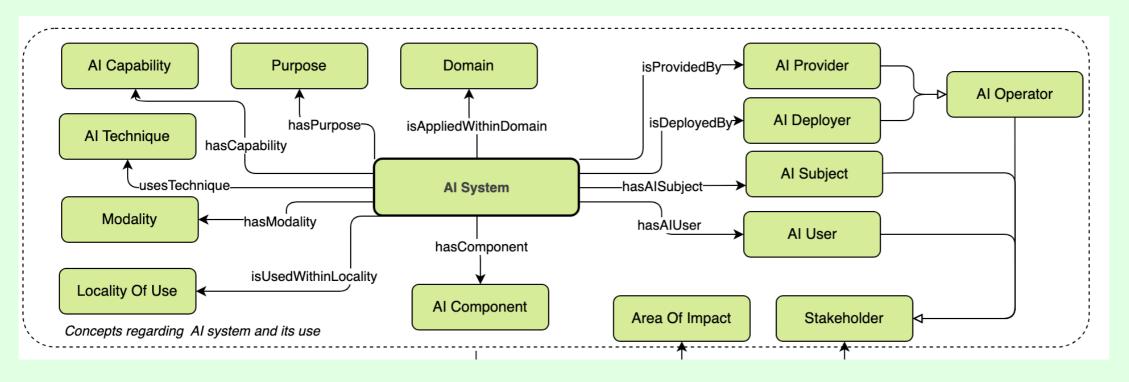
- 1. risk:RiskMatrix3x3: A Risk Matrix with a. risk:RM3x3S1L1: Node in a 3x3 F Low go to full definition
 - b. **risk:RM3x3S1L2**: Node in a 3x3 F Level: Low <u>go to full definition</u>
 - c. risk:RM3x3S1L3: Node in a 3x3 F Moderate go to full definition
 - d. risk:RM3x3S2L1: Node in a 3x3 F Level: Low go to full definition
 - e. risk:RM3x3S2L2: Node in a 3x3 F Risk Level: Moderate go to full defini
 - f. **risk:RM3x3S2L3**: Node in a 3x3 F Level: High <u>go to full definition</u>
 - g. risk:RM3x3S3L1: Node in a 3x3 F Moderate go to full definition
 - h. risk:RM3x3S3L2: Node in a 3x3 F Level: High <u>go to full definition</u>
 - i. **risk:RM3x3S3L3**: Node in a 3x3 F High <u>go to full definition</u>

2023

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AI & AI Act Extension

We increased the scope of our concepts from *personal data* to *any data or technology*



<mark>3.8</mark>	Risk Sources
<mark>3.8</mark> .1	Attack
3.8.2	Adversarial Attack
<mark>3.8</mark> .3	Data Poisoning
<mark>3.8</mark> .4	Model Evasion
3.8.5	Model Inversion
3.8.6	Data Risk Source
3.8.7	Error In Data Collection
3.8.8	Error In Data Prepration
3.8.9	Input Data Risk Source
3.8.10	Erroneous Input Data
3.8.11	Test Data Risk Source

3.3	AI Capabilities
3.3.1	Audio Processing
3.3.2	Sound Source Separation
3.3.3	Sound Synthesis
3.3.4	Speaker Recognition
<mark>3.3</mark> .5	Speech Recognition
<mark>3.3</mark> .6	Speech Synthesis
<mark>3.3</mark> .7	Automatic Summarisation
<mark>3.3</mark> .8	Behaviour Analysis
<mark>3.3.9</mark>	Biometric Categorisation
3.3.10	Biometric Identification
3.3.11	Computer Vision

Based on

 "AIRO: An Ontology for Representing AI Risks Based on the Proposed EU AI Act and ISO Risk Management Standards" by Golpayegani et al.
 " To Be High-Risk, or Not To

2023

Be-Semantic Specifications and Implications of the AI Act's High-Risk AI Applications and Harmonised Standards" by Golpaywgani et a. Data Privacy Vocabulary — Version 2 | International Semantic Web Conference (ISWC) | 14 NOV 2024 | Baltimore, Maryland, USA

Who is using DPV? What are they doing?

Year	Mention	Use	Ext.	Contrib.	Domain	Effort
2020	X				Health	N/A
2020	X				Media	N/A
2020	X					N/A
2020		Х				++
2020		Х			Health	++
2020			Х	X		++
2021	X				Health	N/A
2021	X					N/A
2021		Х				++
2021		Х			Smart products	+
2021			Х	X		+
2022	X					N/A
2022	X			X		N/A
2022			Х	X		+
2022	X				Health	N/A
2022		Х				+
2022		Х			IoT	+
2022		Х			Health	+
Γ.						

Creating a **vocabulary** for **data privacy**: The first-year report of **data privacy vocabularies** and controls community group (DPVCG)

2024

HJ Pandit, A Polleres, B Bos, R Brennan... - On the Move to ..., 2019 - Springer

...) was set up to jointly develop such vocabularies towards interoperability in the context of

data privacy. This paper presents the resulting Data Privacy Vocabulary (DPV), along with a ...

☆ Save 55 Cite Cited by 96 Related articles All 9 versions

(At the time of writing the paper we had 81 citations)

We looked at how much *Effort* it would take for these works to integrate the changes made in DPV.

Most works only required minor changes in changed concepts (+ *in table*), other works required changing IRIs to the new formats as they were using an old prev1.0 draft version of the DPV.

Prototyping an End-User User Interface for the Solid Application Interoperability Specification under GDPR by H Bailly, A Papanna, R Brennan wins **Best In-Use Paper award** at ESWC 2023

 $\frac{2}{2}$ Using Patterns to Manage Governance of Solid Apps by B. Esteves, H. Pandit wins **Best Paper** $\frac{2}{2}$ **award** at Workshop on Ontology Patterns (WOP), ISWC 2023 $\frac{Y}{2}$

² $\frac{Y}{2}$ Implementing ISO/IEC TS 27560: 2023 Consent Records and Receipts for GDPR and DGA by H. ² Pandit, J. Lindquist, G. P. Krog wins **Best Paper award** at Annual Privacy Forum 2024 organised by ² European Union Agency for Cybersecurity (ENISA) and EU Commission _ $\frac{Y}{2}$

Are projects* and the industry using DPV? 2024



Industry

Signatu Inrupt JLINC

Athumi / Solid Lab

* These are the projects we know about. Most uses of DPV go unreported, and DPV is also commonly referenced in footnotes and inline text which we do not have a way to track. Projects also contained industry partners. Spotlight: Signatu's use of DPV (Georg P. Krog)

Signatu: Practical Implementation

Signatu provides a practical solution for implementing ISO/IEC TS 27560:2023 using the the Data Privacy Taxonomy for GDPR and DGA compliance. **Signatu's** Legal Compliance and Consent Management Platforms offer tools for creating, managing, and exchanging consent records and receipts in line with the latest standards.

Name: Email Newsletter Purpose: To distribute regular updates, promotions, and information to sub- email. Purpose Category: dpv:DirectMarketing Personal Data Collected:	scribers v Email address, Name Data Categories Email Address 🛞 Name 🛞
O Name (optional) Legal Basis: Consent Now, let's map the personal data to the DPV personal data categories: Email address corresponds to pd:EmailAddress Name corresponds to pd:Name Would you like to proceed with this overview, or do you have any changes?	Email Address dpv:PersonalData / pd:EmailAddress Information about Email address. Name dpv:PersonalData / pd:Name
Data Entry Chatbot	Taxamamay Dankasantatian
To distribute regular updates, promotions, and information to subscribers via On email.	
To distribute regular updates, promotions, and information to subscribers via On	
To distribute regular updates, promotions, and information to subscribers via On email.	<pre>"dpv:hasProcess": [1 item "0: { 3 items</pre>

https://www.w3.org/community/dpvcg/ wiki/Adoption_of_DPVCG

Data Privacy Vocabulary - Version 2 | International Semantic Web Conference (ISWC) | 14 NOV 2024 | Baltimore, Maryland, USA

Use of DPV in Standards



DPV's consent modeling and concepts are used to develop ISO/IEC TS 27560:2023 standard



DPV is directly used in an ISO standard for representing consent records/receipts as Linked Data.

2024

Consent Records and Receipts as per ISO/IEC TS 27560:2023 using DPV

Final Community Group Report 01 August 2024

DPVCG provides an implementation guide for representing consent records/receipts

https://w3id.org/dpv/guides/consent-27560

EXAMPLE 39: Example of a Consent Record "@id": "https://example.com/a6f5 "@type": "dpv:ConsentRecord", "dct:identifier": "a6f58318-72e6 "dct:conformsTo": "https://w3id." "dpv:hasDataSubject": { "@id": "0760c9ba", "skos:broader": "dpv:Consume }, "dpv:hasDataController": "ex:Acm "dpv:hasDataProcessor": "ex:Beta "dpv:hasJurisdiction": "loc:IE", "dpv:hasApplicableLaw": "eu-gdpr "dpv:hasProcess": { "@type": "dpv:Process", "dpv:hasRecipient": ["ex:Acm "dpv:hasPurpose": "dpv:Payme "dpv:hasPersonalData": "pd:E "dpv:hasStorageCondition": ["@type": "dpv:StorageLoc "dpv:hasLocation": ["loc }, { "@type": "dpv:StorageDura "dpv:hasDuration": "P6M" }, { "@type": "dpv:StorageDel "dpv:hasDuration": "P1M" }] },

{

2024

And then we released DPV version 2.0 on 1 AUG 2024...

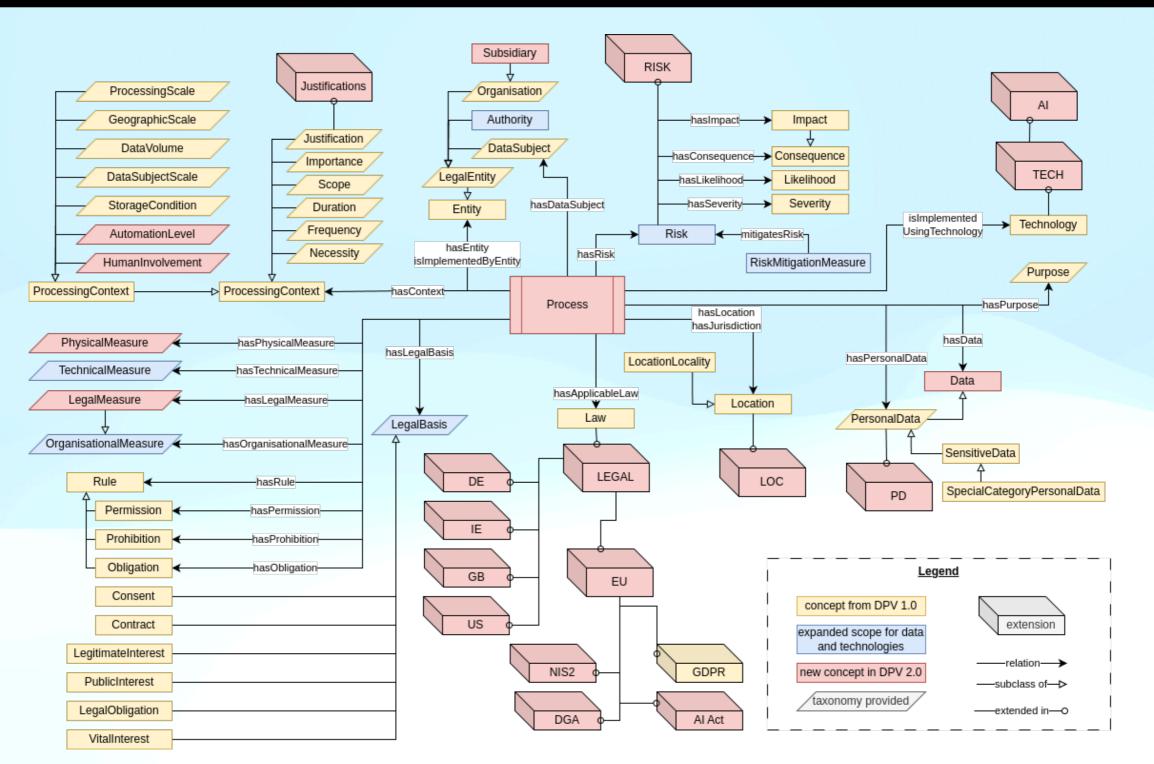
DPV 2.0 Release 🎉

The DPVCG is proud to present <u>DPV version 2.0</u> - a major release that significantly improves and expands the scope and usefulness as compared to DPV 1.0.

The article <u>Data Privacy Vocabulary (DPV) -- Version 2</u> by Pandit et al. (2024), accepted for presentation at the 23rd International Semantic Web Conference (ISWC 2024), describes DPV 2.0 in terms of its contents methodology, current adoptions and uses, and future potential. It also describes the relevance and role of DPV in acting as a common vocabulary to support various regulatory (e.g. EU's DGA and AI Act) and community initiatives (e.g. Solid) emerging across the globe. A <u>Search Index</u> of all concepts from DPV and extensions is available.

Summary of Changes

Maior Changes



2394 concepts (with 2198 classes and 196 properties)

https://w3id.org/dpv/2.0/changelog

2024

What's coming next?

DPV 2.1 is scheduled for release in JAN'25 with ~6000 concepts - a 3x increase!



Come join us in the W3C Data Privacy Vocabularies and Controls Community Group (DPVCG) !!!

Find a short intro at <u>https://www.dpvcg.org/</u>

Primer

Data Privacy Vocabulary (DPV)

Final Community Group Report 01 August 2024

https://w3id.org/dpv/primer

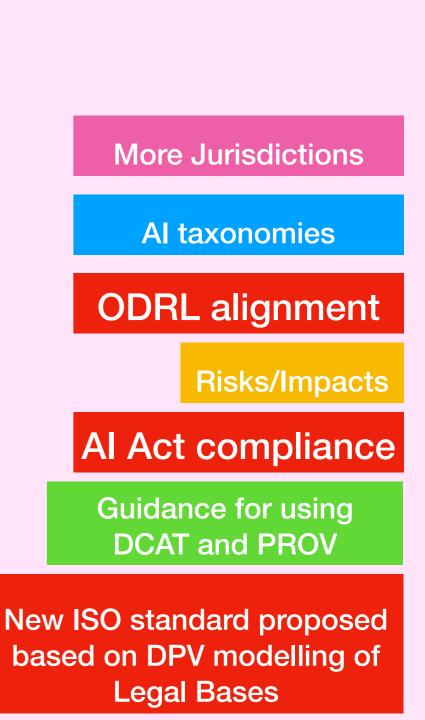
IEEE SA STANDARDS ASSOCIATION

IEEE

IEEE P7012

IEEE Draft Standard for Machine Readable Personal Privacy Terms

IEEE P7012 is using DPV to express terms



2025

Machine-Actionable Rights





Data Privacy Vocabulary





https://w3id.org/dpv

Harshvardhan J. Pandit

ADAPT Centre, Dublin City University, Dublin, Ireland me@harshp.com

Beatriz Esteves IDLab, Ghent University – imec, Ghent, Belgium <u>beatriz.esteves@ugent.be</u>

Georg P. Krog Signatu AS, Oslo, Norway georg@signatu.com

Paul Ryan ADAPT Centre, Dublin City University, and Uniphar PLC, Dublin, Ireland paul.ryan76@mail.dcu.ie

Delaram Golpayegani

ADAPT Centre, Trinity College Dublin, Dublin, Ireland delaram.golpayegani@adaptcentre.ie

Julian Flake University of Koblenz, Koblenz, Germany flake@uni-koblenz.de

Presented at

