

The logo for CIO LAWS is displayed at the top of the slide. 'CIO' is in a large, blue, sans-serif font, while 'LAWS' is in a white, sans-serif font. The background of the top section features a blue and white geometric pattern of squares and lines, with a bright light flare on the right side.

# CIO LAWS

## **IT law modelling: methodologies, architecture and ontologies**

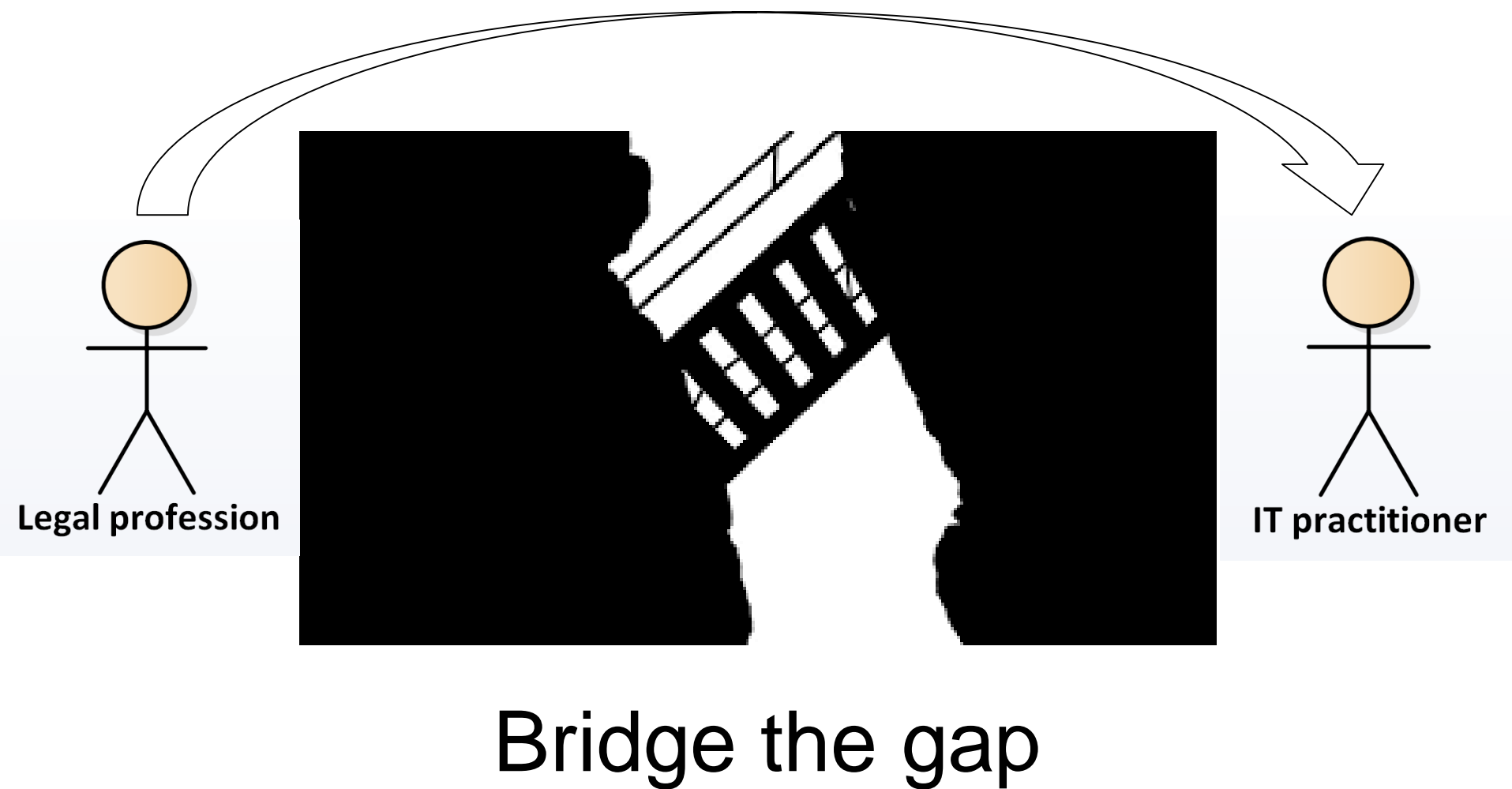
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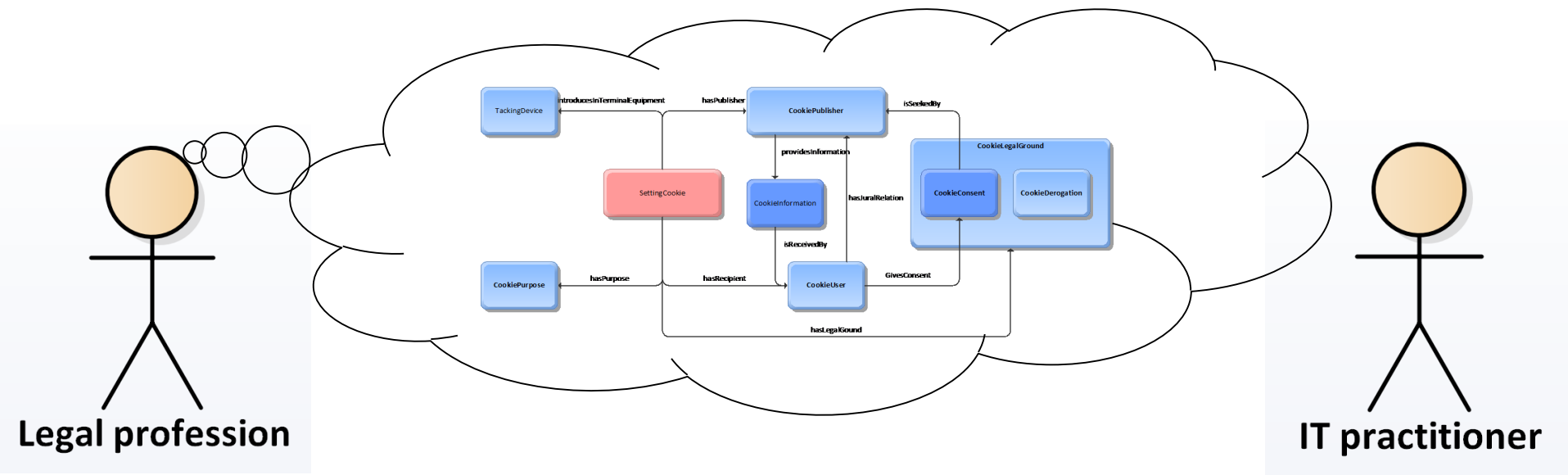
IT Executive and Jurist

Blogger @CIOlaws.com

# Legal knowledge



# Models



- Abstract
- Visual



# Table of content

- Research questions
- Epistemology
- Methodology
- Results
- Evaluation



# Research questions

- Q1: is IT law modelling suitable to teach the domain of IT law to an audience of non-legal experts?
- Q2: what is the most suitable design formalisms to model the domain of IT law for didactic purposes?



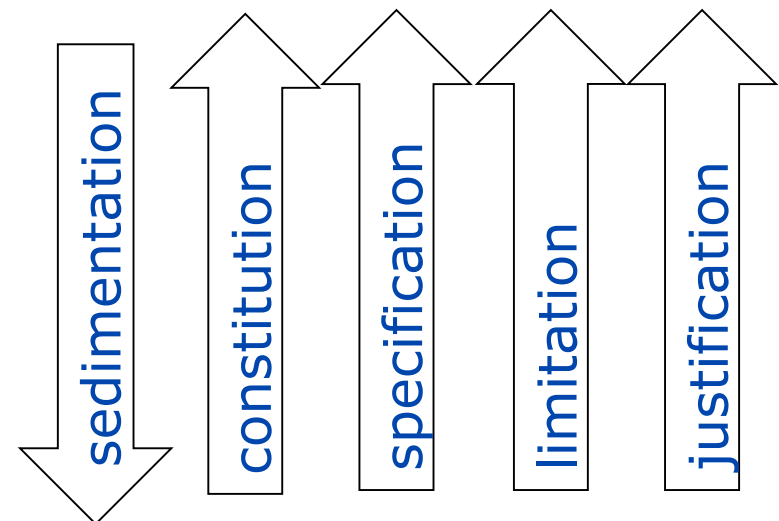
# Table of content

- Research questions
- **Epistemology**
- Methodology
- Results
- Evaluation

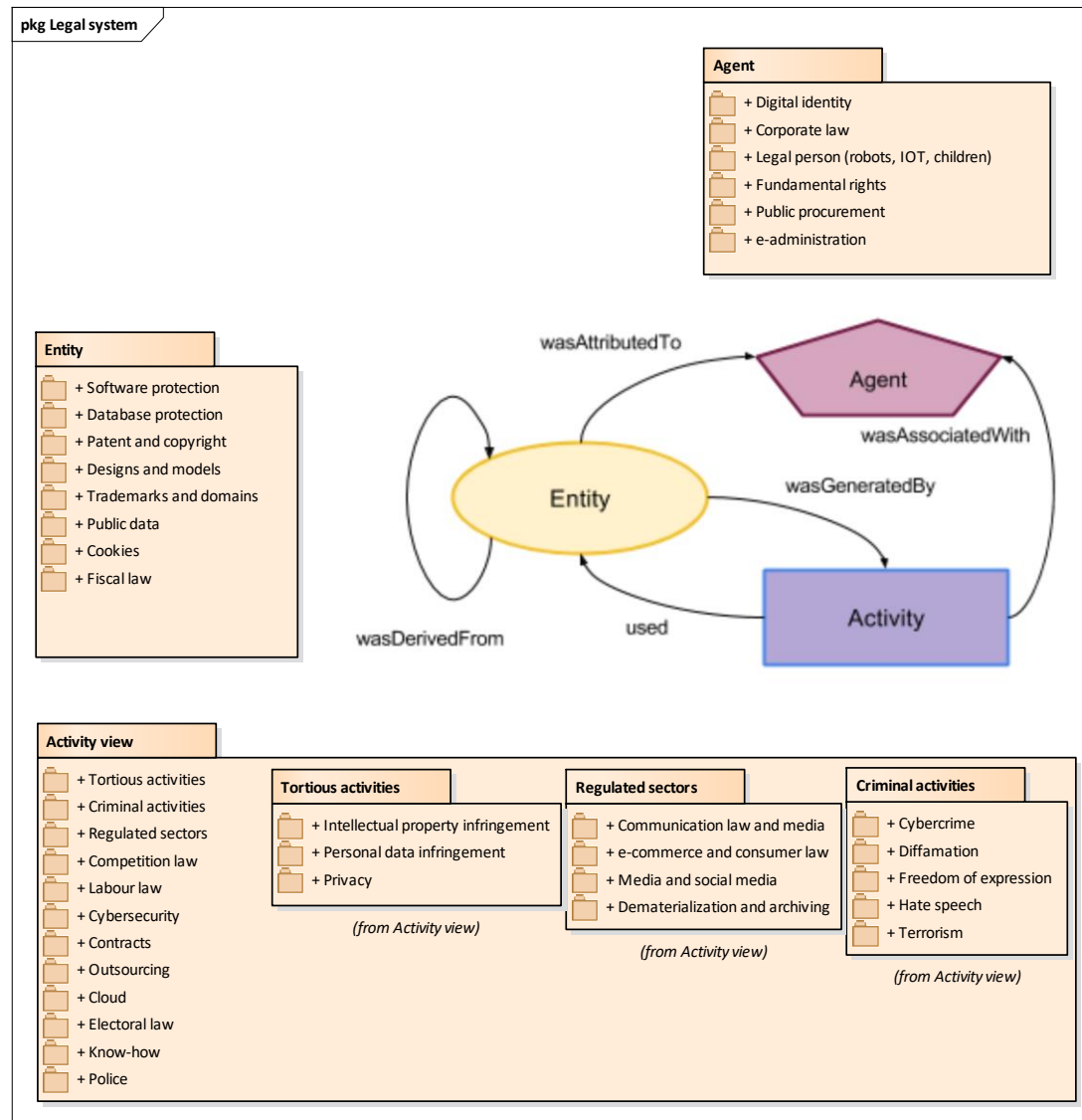
# Epistemology of law

- Kaarlo Tuori's critical legal positivism

<b>Politic</b>
Policies, Goals
<b>Legal order</b>
<b>Surface of law</b> Rules, Principles
<b>Legal culture</b> Meta-norms, Doctrine, patterns of argumentation, concepts, principles
<b>Deep structure of law</b> Legal rationality, categories, fundamental principles (e.g. human rights)
<b>Moral</b>
Values, Principles

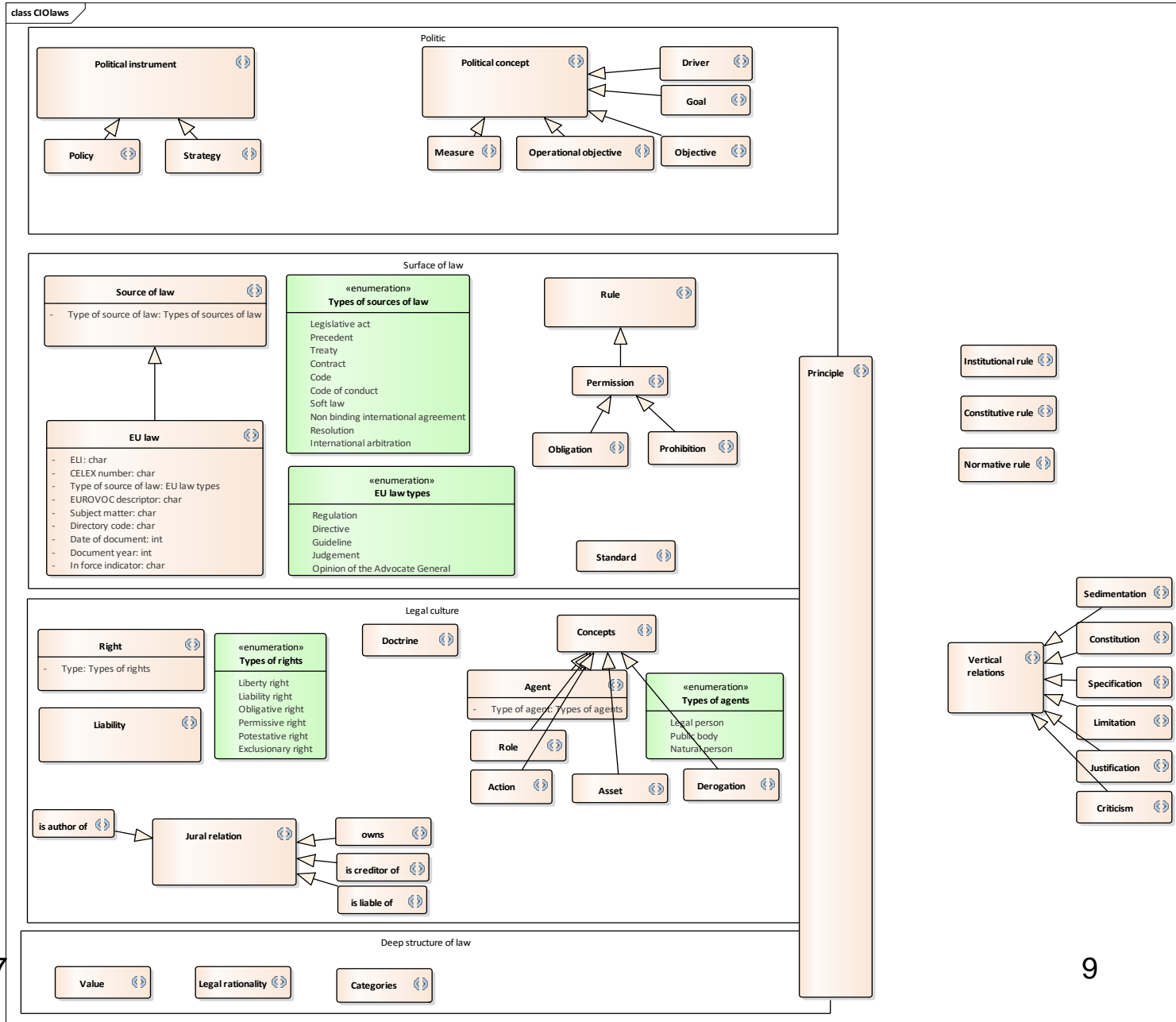


# Substantive view of IT law





# Metamodel



# Ontology reuse

- Author own legal culture
- CEN/Metalex
- Critical legal positivism
- Howtoregulate.org
- LKIF
- ORDL Core and vocabularies

Source \ Target						
	Author's own legal culture	CEN/Metalex	Critical Legal Positivism	howtoregulate.org	LKIF	ORDL Core and vocabularies
Action					✓	✓
Actor						
Agent					✓	✓
Artifact						
Asset						✓
Categories			✓			
Class						
Concepts			✓			
Connector						
Constitution			✓			
Constitutive rule	✓					
Criticism			✓			
Derogation	✓					
Doctrine			✓			
Driver				✓		
EU law		✓				
EU law types		✓				
Goal				✓		
Institutional rule	✓					



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# Methodology

- NeOn methodology for ontology design

# Q2: requirements

Requirement	Weight
<b>Modelling</b>	
<i>Modelling capability</i>	
<i>Domain modelling</i>	<i>Must</i>
<i>Modularity and architecture</i>	<i>Must</i>
<i>Norm representation</i>	<i>Must</i>
<i>Epistemological expressiveness</i>	<i>Should</i>
<i>Modelling productivity</i>	
<i>Templates</i>	<i>Should</i>
<i>Specification management</i>	<i>Could</i>
<i>Reuse of existing objects</i>	<i>Should</i>
<i>Graphical UI support to define objects</i>	<i>Must</i>
<i>Central modelling tool holding all objects</i>	<i>Should</i>
<i>Graphical UI support to define diagrams</i>	<i>Should</i>
<b>Sharing</b>	
<i>Publishing</i>	<i>Must</i>
<i>Extraction mechanism to produce documentation</i>	<i>Must</i>
<i>Quality of delivered documentation artifacts</i>	<i>Should</i>
<i>Reuse by inference engines</i>	<i>Won't</i>
<b>Maintaining</b>	
<i>Support for versioning</i>	<i>Should</i>
<i>Versions comparison</i>	<i>Could</i>
<i>Rollback</i>	<i>Could</i>



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# Test bed

- Article 5(3) of the e-Privacy Directive (Cookies)
- General Data Protection Regulation
- Data subject's consent in Directive 95/46/EC

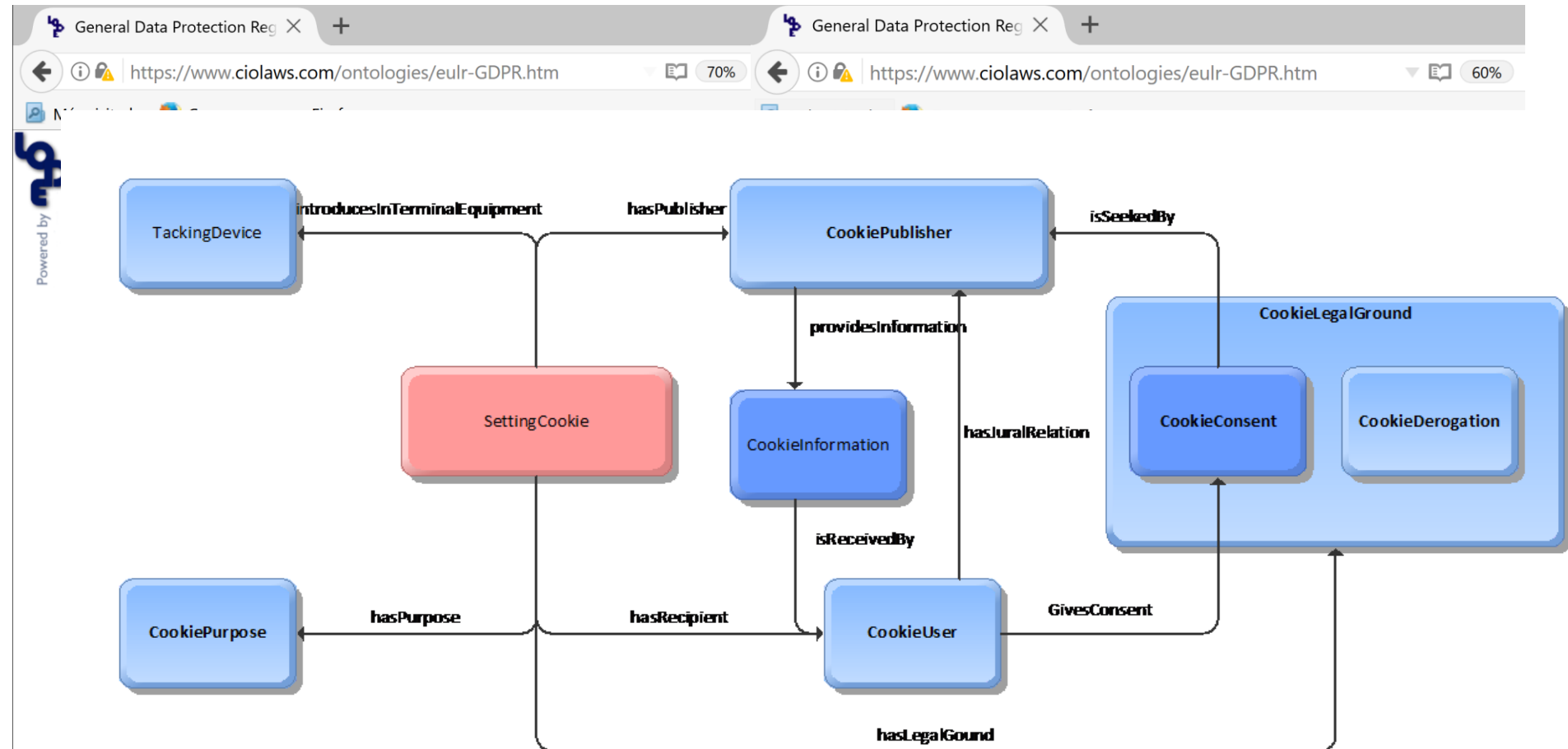


## Q2: design paradigm

- The model is formally specified using:
  - OWL notation (Web ontology language)
  - UML notation (Unified Modelling Language)



# OWL documentation



## Summary

This ontology highlights the key themes of the General Data Protection Regulation (GDPR). Its purpose is to provide a structured representation of the requirements of the GDPR ahead of the 25th May 2018, when the GDPR will apply in all Member States. The GDPR lays down rules relating to the protection of natural persons with regard to the processing of personal data.

The Ontology uses a general granularity at the level of legal provisions, representing rights, obligations, and legal sources.

IRI: <http://ciolaws.com/ontologies/eulr-GDPR#AdequacyDecision>

is defined by

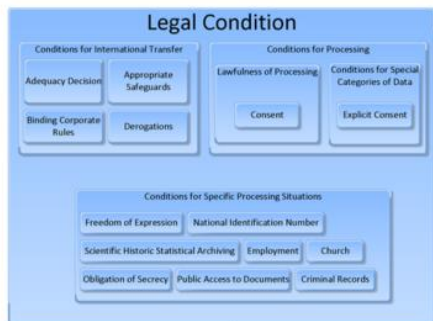
<http://ciolaws.com/ontologies/eulr-GDPR#GDPRart45>

Transfers on the basis of a Commission decision (Article 45)

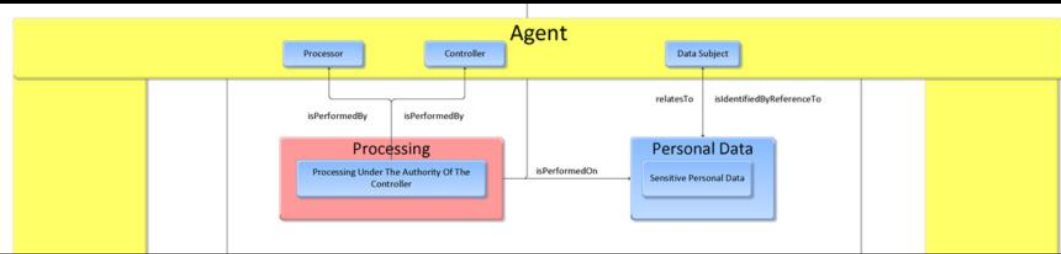
Transfers may be made where the Commission has decided that a third country, a territory or one or more specific sectors within that territory offer an adequate level of data protection.

has super-classes

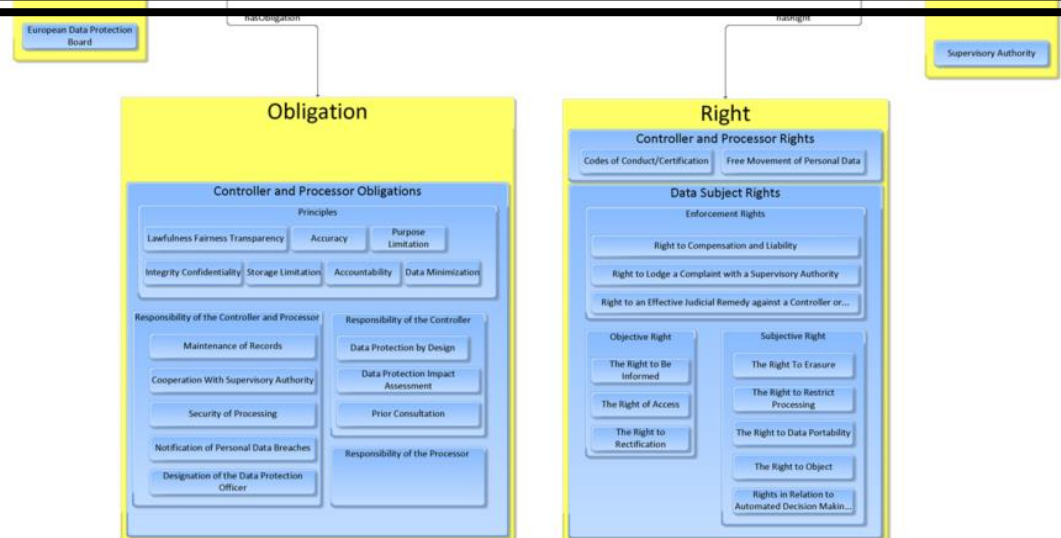
# Anatomy of the GDPR



Legal conditions  
(legal basis)  
How?



Legal definitions  
(applicability)  
Who? When?  
What?

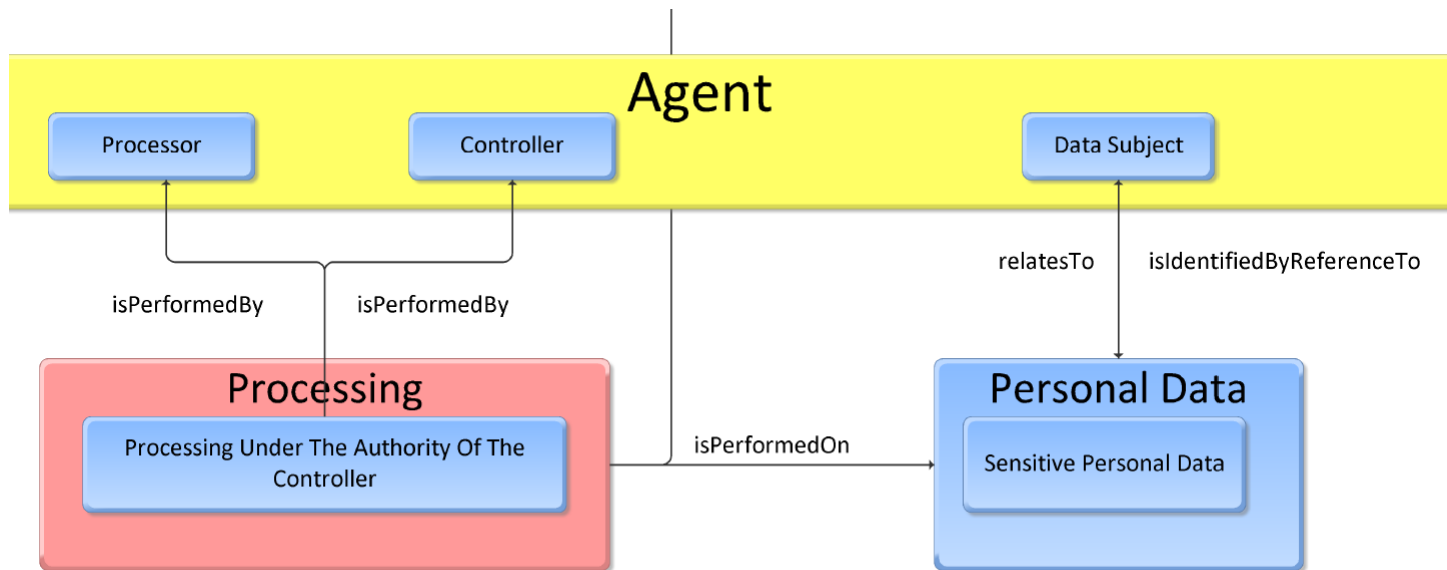


Legal effects  
(rights and obligations)

31 December 2017

Who?      What?

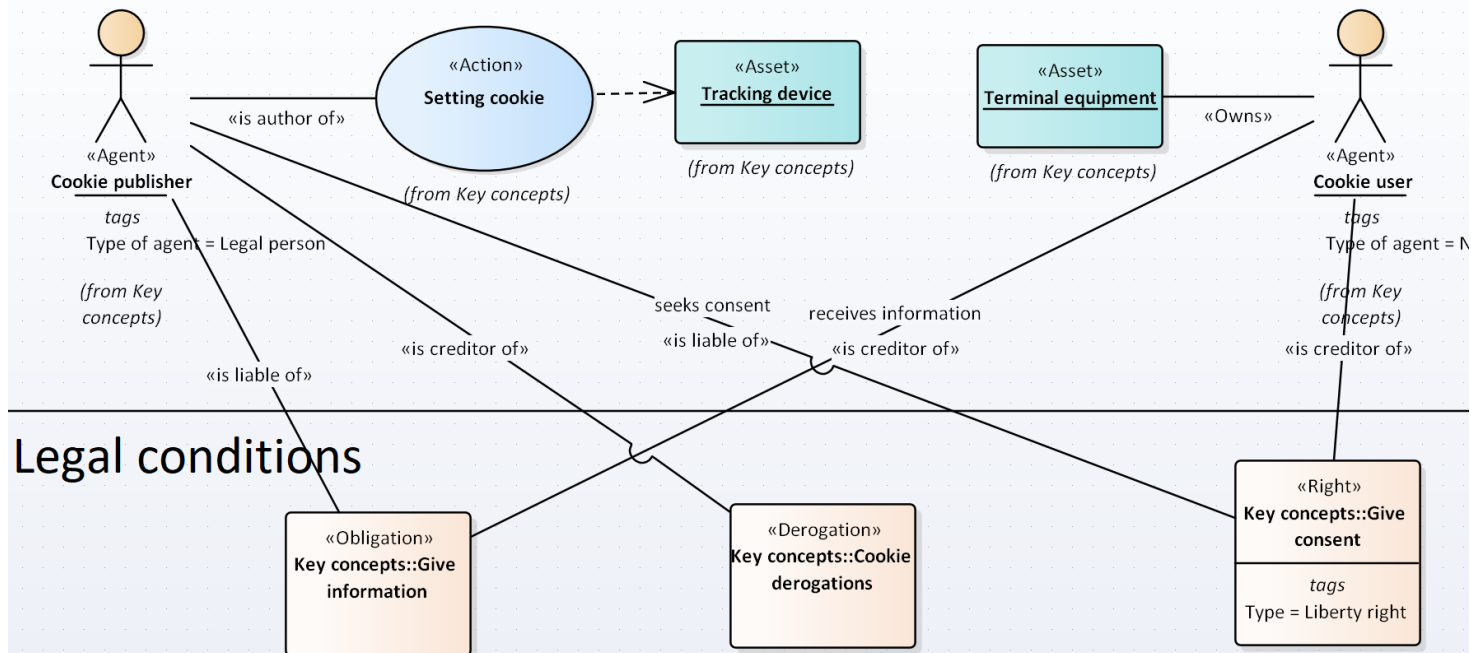
When?



# Unified Modeling Language

- UML Profiles
  - CIOlaws
    - Action
    - Agent
    - Asset
    - Categories
    - Competency question
    - Concepts
    - Constitution
    - Constitutive rule
    - Criticism
    - Derogation
    - Doctrine
    - Driver
    - EU law
    - Goal
    - Institutional rule
    - Jural relation
    - Justification
    - Legal rationality
    - Limitation
    - Measure
    - Normative rule
    - Objective
    - Obligation
    - Operational objective
    - Permission
    - Policy
    - Political concept
    - Political instrument
    - Principle
    - Prohibition

## Legal definitions





# Unified Modeling Language

- Demo of HTML documentation



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# Q1

- User test

Modelling Tool Features vs Requirements			
Requirement	Weight	OWL/Protégé	UML/EA
<b>Modelling</b>			
<i>Modelling capability</i>			
<i>Domain modelling</i>	<i>Must</i>		
<i>Modularity and architecture</i>	<i>Must</i>		
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<i>Versions comparison</i>	<i>Could</i>		
<i>Rollback</i>	<i>Could</i>		



# CIOLAWS

**THANK YOU!**

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- Head of Unit for Business Information Systems at ECHA (2011-present)
- CIO of the Autonomous University of Madrid (2007-2011)

## ❑ Jurist

- BA in Law (Paris I Pantheon-Sorbonne - 2015)
- PhD candidate (UPM, Knowledge Engineering Group; UAB, Institute of Law and Technology)
- Blogger - CIOlaws.com ("Demystifying Law for the IT community")
- Accredited ISACA member

# CIOLAWS

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