

Project Launch:

SPECIAL (a Scalable Policy-aware linked data arChitecture for prIvacy, trAnsparency and compLiance)

Axel Polleres, Vienna University of Economics and Business (WU Wien)

MyData 2017, Tallinn/Helsinki

30/08/2017



SPECIAL



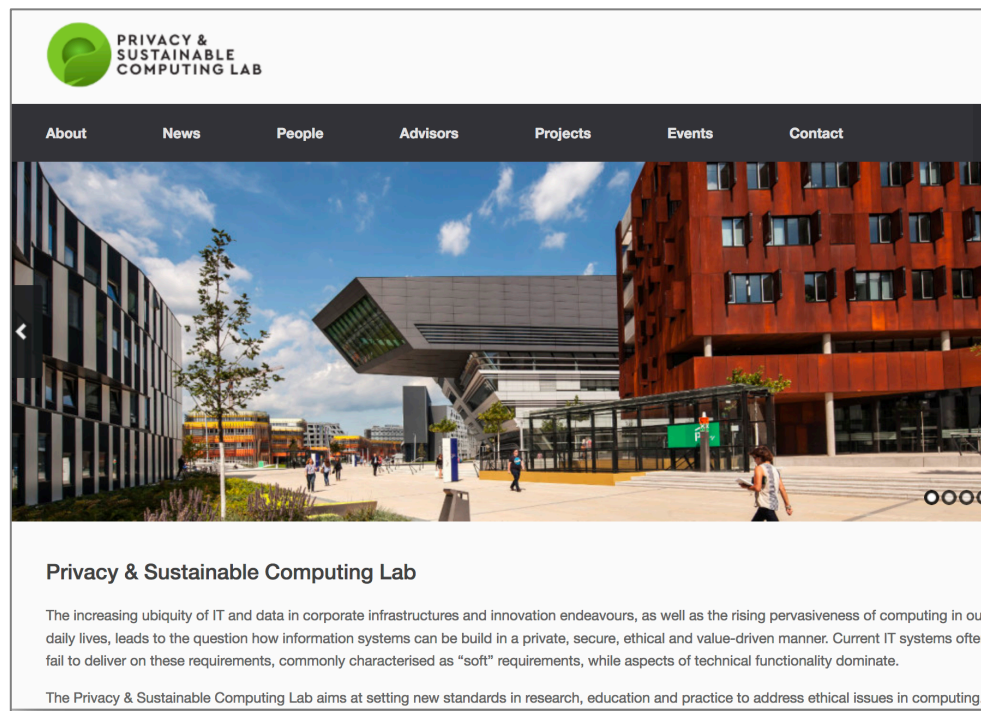
European
Commission

Horizon 2020
European Union funding
for Research & Innovation



Where I am coming from, collaborators...

- **Privacy & Sustainable Computing Lab**
- <http://www.privacylab.at/>
- Launched September 2016, launch event with various important stakeholders: technologists, standardization, activists...
- Goal: setting new standards in research, education and practice to address ethical issues in computing.



Dr. Sabrina Kirrane
(Lab co-Director)



Dr. Benjamin Wagner
(Lab co-Director)



Prof. Sarah Spiekermann
(co-founder)

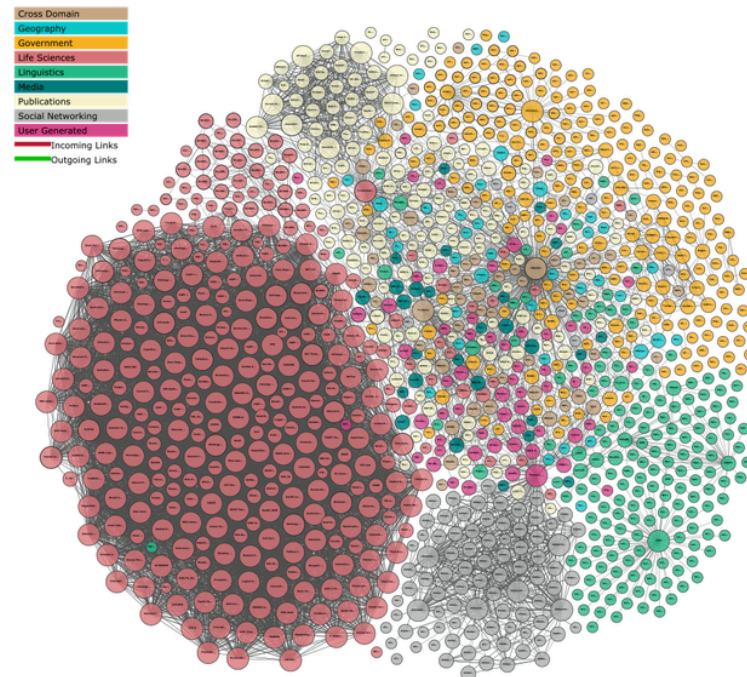


Prof. Axel Polleres
(co-founder)

Where I am coming from, collaborators...

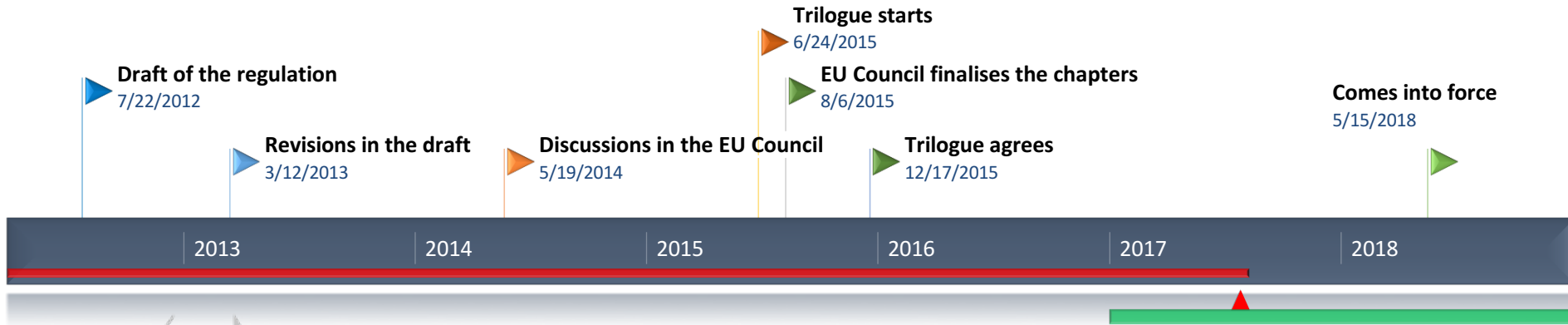
- **Privacy & Sustainable Computing Lab**
- <http://www.privacylab.at/>
- Launched September 2016, launch event with various important stakeholders: technologists, standardization, activists...
- Goal: setting new standards in research, education and practice to address ethical issues in computing.

- What can we bring in here:
 - Web Standards
 - Linked Data
 - Ontologies
 - Scalable Data Processing and Querying

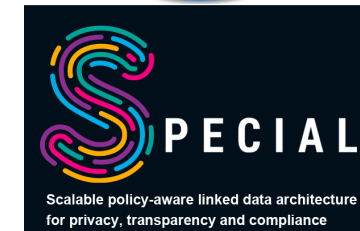
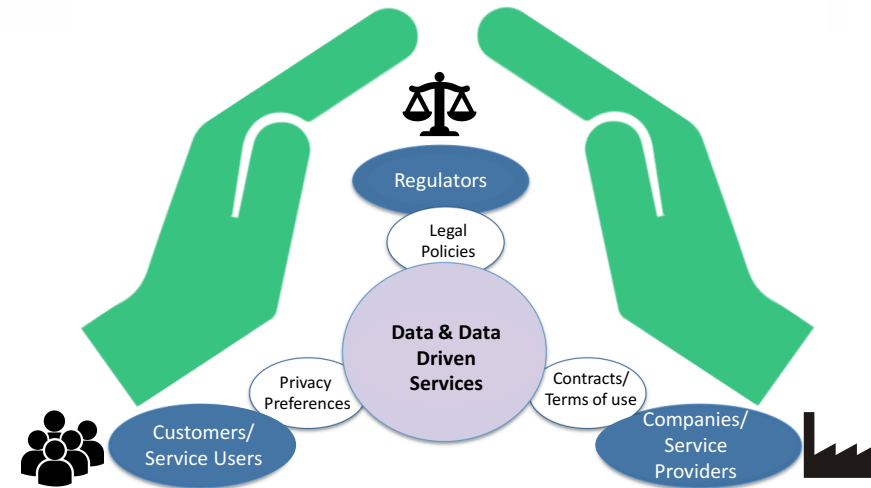


**Prof. Axel
Polleres
(co-founder)**

Privacy in the EU: all about the upcoming GDPR, How can we support it technically?...



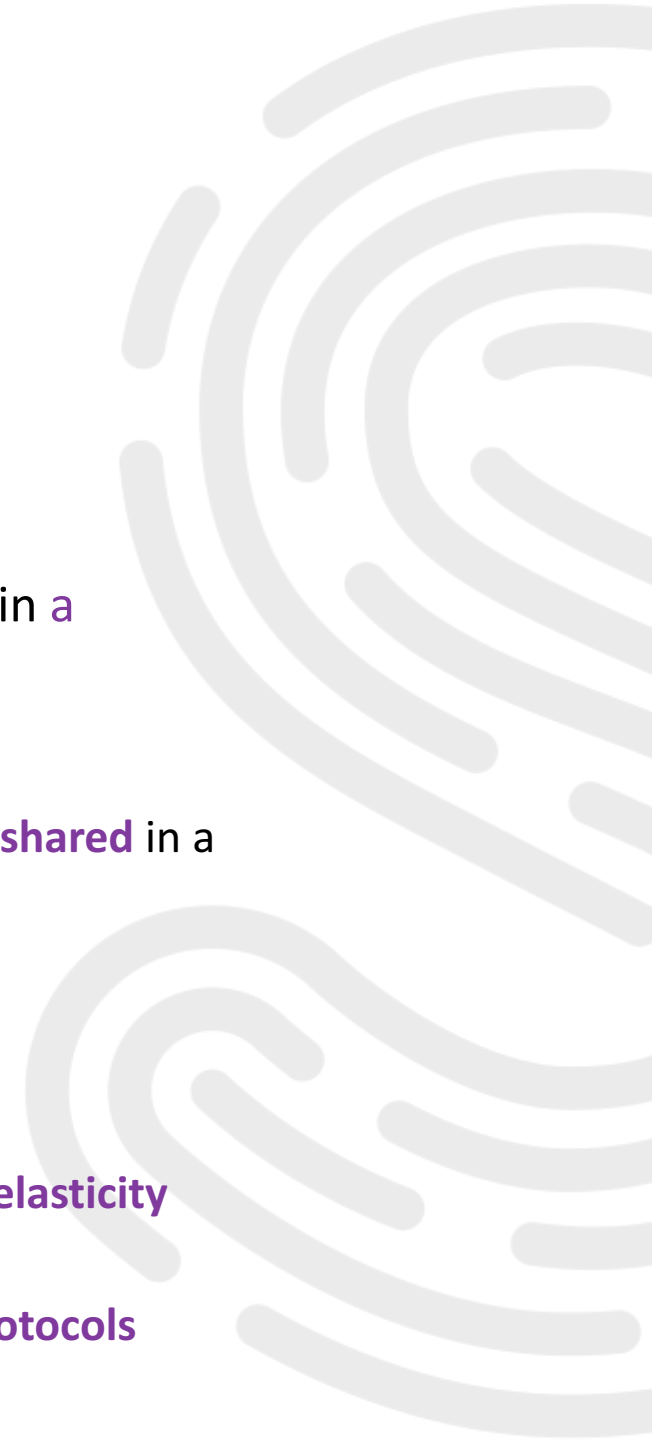
Horizon 2020
European Union funding
for Research & Innovation



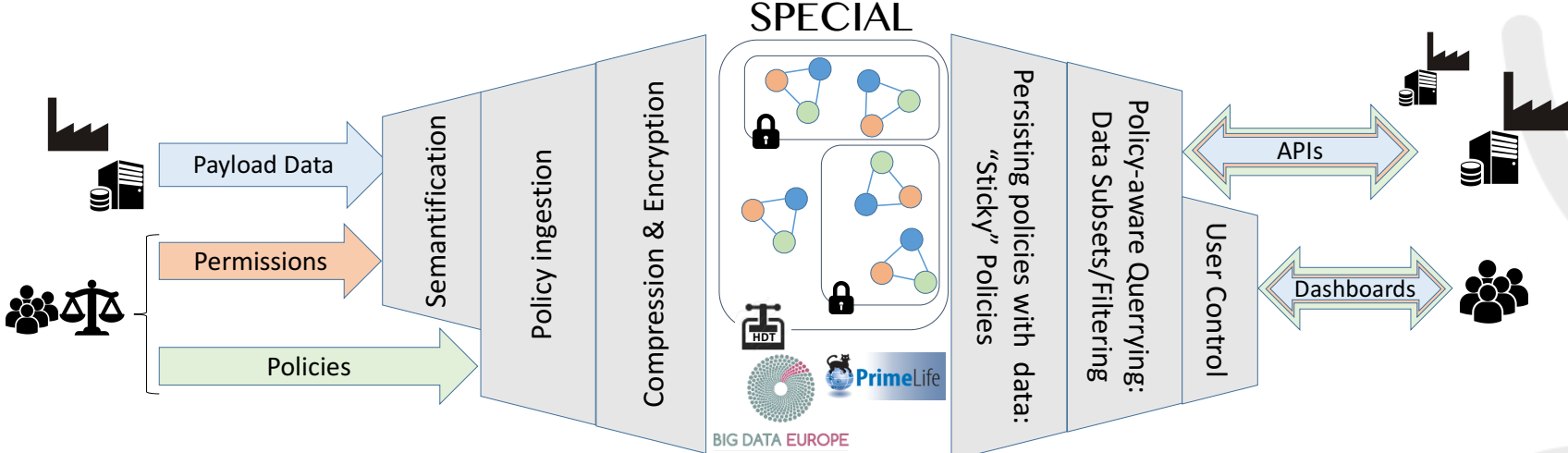
2017-2019
(3 years)

The SPECIAL project: Objectives

- Policy management framework
 - Give **users control** of their personal data
 - Represent **access/usage policies** and **legislative requirements** in a **machine readable format**
- Transparency and compliance framework
 - Provide information on how data is **processed** and with whom it is **shared** in a common format (RDF) via standard interfaces
 - Allows data subjects as well as regulators to check **compliance** (via automated reasoning)
- Scalable policy-aware Linked Data architecture
 - Build on top of the Big Data Europe (BDE) platform **scalability and elasticity mechanisms**
 - Extended BDE with **robust policy, transparency** and **compliance protocols**



SPECIAL Technical Components:

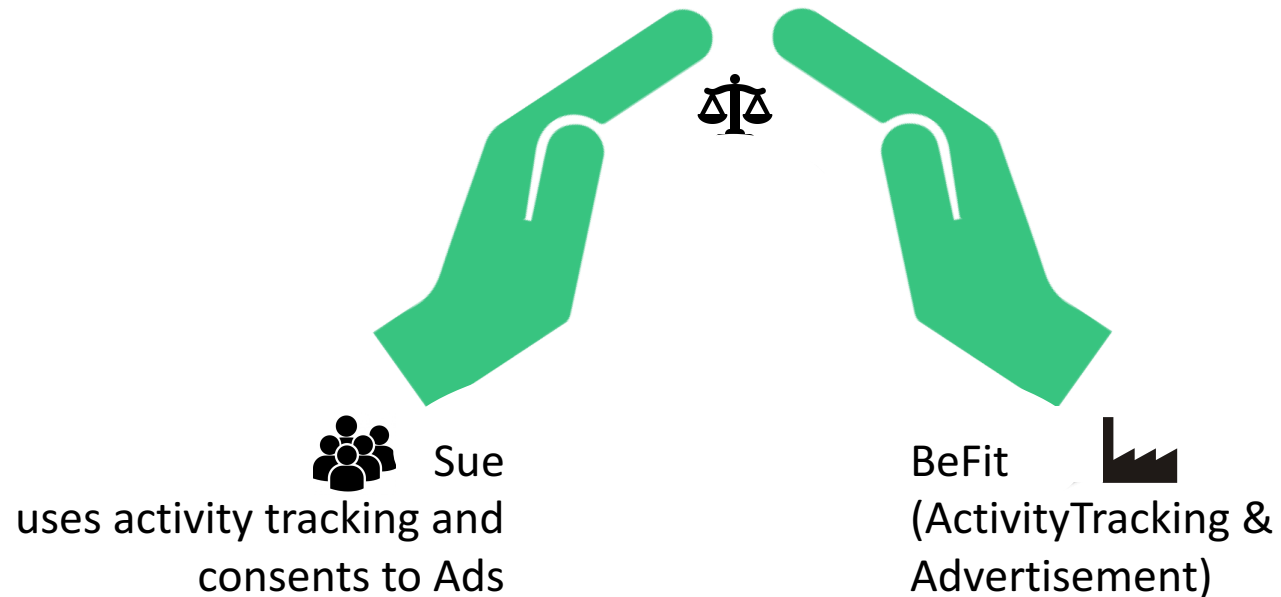


- **Big Data Europe** scalability and elasticity
- **PrimeLife** policy languages, access control policies, release policies and data handling policies

SPECIAL Use Cases:



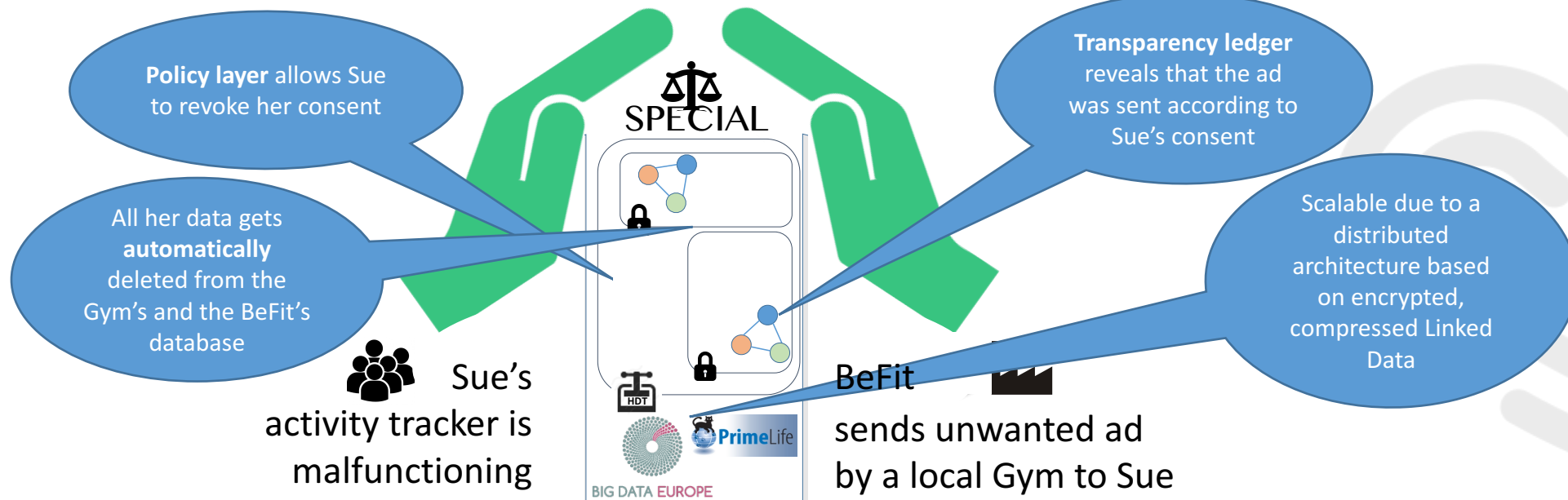
An example scenario:



SPECIAL Use Cases:



An example scenario:



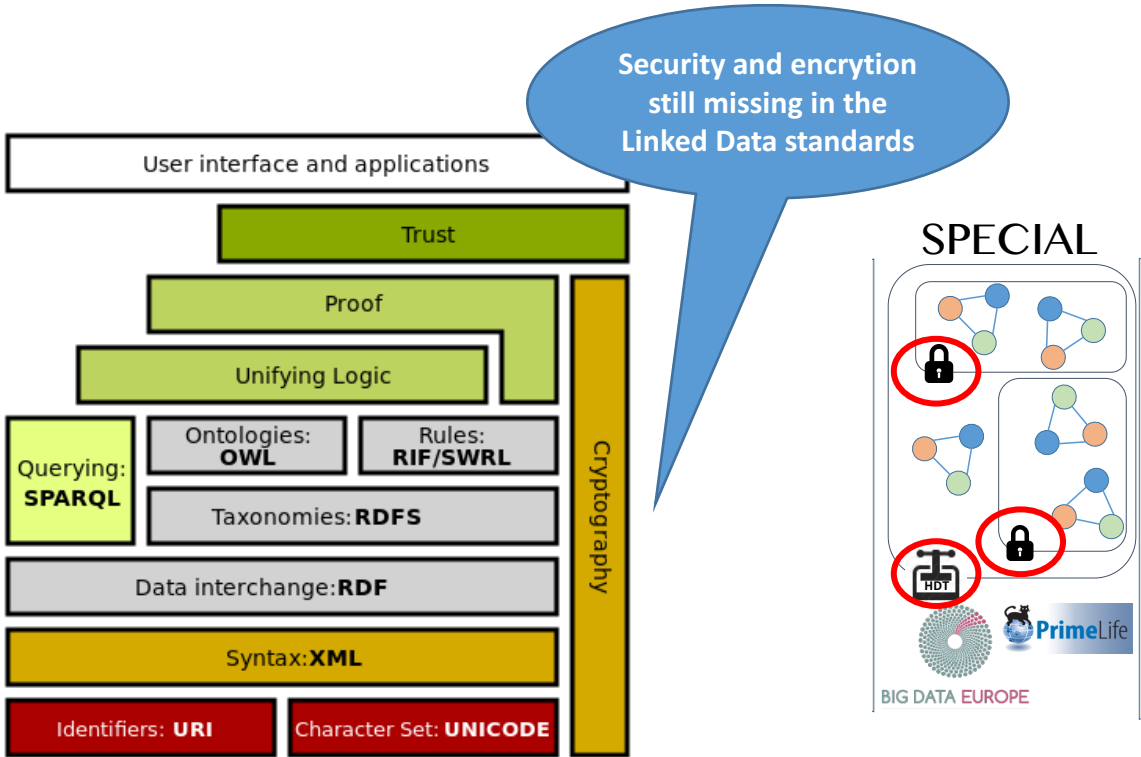
SPECIAL Results so far:

- 6 months into the project:
- Recent Publications:
 - **Self-Enforcing Access Control for Encrypted Linked Data.** Javier D. Fernández, Sabrina Kirrane, Axel Polleres, and Simon Steyskal. [Extended Semantic Web Conference \(ESWC 2017\)](#). May 2017
 - **Transparent Personal Data Processing: The Road Ahead.** Piero Bonatti, Sabrina Kirrane, Axel Polleres, and Rigo Wenning. [TELERISE: 3rd International Workshop on TEchnical and LEgal aspects of data pRivacy and Security](#). Sep 2017
- Next deliverables forthcoming:
 - **D1.3 Policy, transparency and compliance guidelines:** Requirements for an Ontology and Policy Language for formalizing and reasoning about Policies and Consent
 - **D1.4 Technical requirements:** First architecture blueprint, based on the BigData-Europe architecture (<https://www.big-data-europe.eu/>)
- Community building, common Standards and Best Practices: Planned W3C workshop and Community group on **Linked data Vocabularies for Transparency and Privacy controls (planned for early of 2018) – Please join us!**



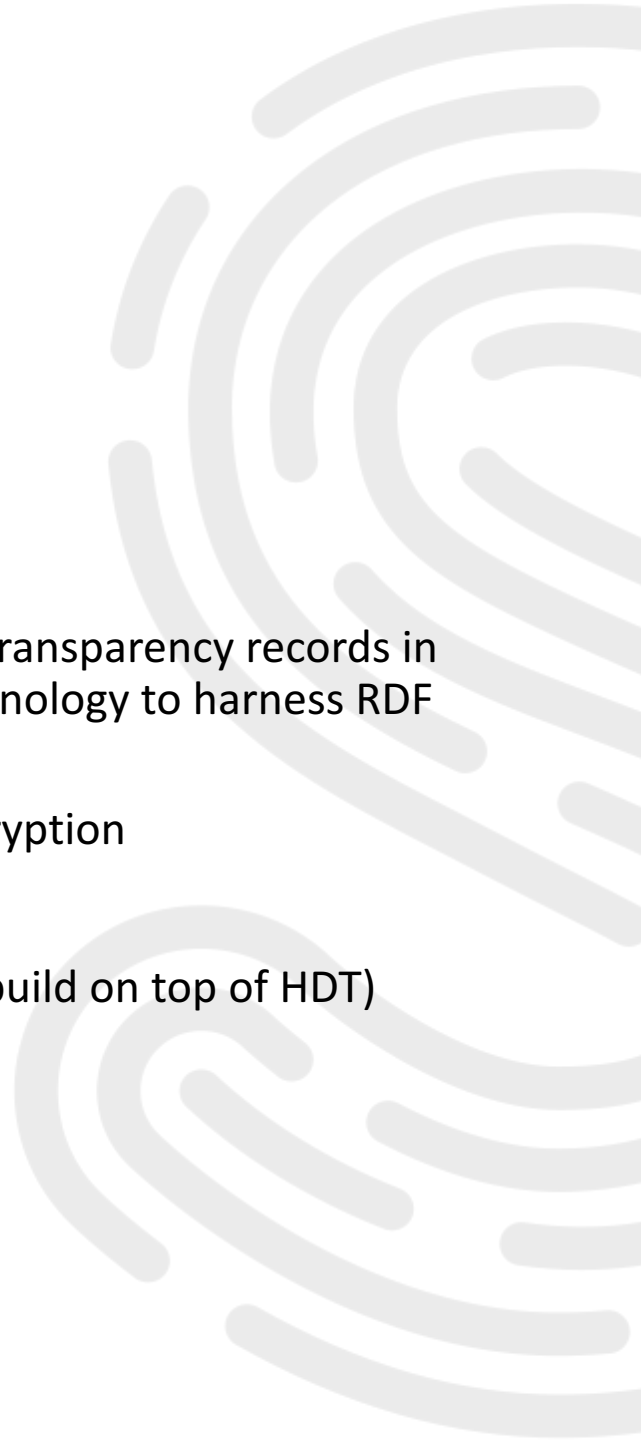
SPECIAL Results so far:

- **Self-Enforcing Access Control for Encrypted Linked Data.** Javier D. Fernández, Sabrina Kirrane, Axel Polleres, and Simon Steyskal. [Extended Semantic Web Conference \(ESWC 2017\)](#). May 2017



Storing consent, transparency records in RDF requires technology to harness RDF with:

- Queryable encryption
- Access control
- Compression (build on top of HDT)



SPECIAL Results so far:

- 6 months into the project:
- Recent Publications:
 - **Self-Enforcing Access Control for Encrypted Linked Data.** Javier D. Fernández, Sabrina Kirrane, Axel Polleres, and Simon Steyskal. [Extended Semantic Web Conference \(ESWC 2017\)](#). May 2017
 - **Transparent Personal Data Processing: The Road Ahead.** Piero Bonatti, Sabrina Kirrane, Axel Polleres, and Rigo Wenning. [TELERISE: 3rd International Workshop on TEchnical and LEgal aspects of data pRivacy and Security](#). Sep 2017
- Next deliverables forthcoming:
 - **D1.3 Policy, transparency and compliance guidelines:** Requirements for an Ontology and Policy Language for formalizing and reasoning about Policies and Consent
 - **D1.4 Technical requirements:** First architecture blueprint, based on the BigData-Europe architecture (<https://www.big-data-europe.eu/>)
- Community building, common Standards and Best Practices: Planned W3C workshop and Community group on **Linked data Vocabularies for Transparency and Privacy controls (planned for early of 2018) – Please join us!**



SPECIAL Results so far:

- **Transparent Personal Data Processing: The Road Ahead.** Piero Bonatti, Sabrina Kirrane, Axel Polleres, and Rigo Wenning. [TELERISE: 3rd International Workshop on TEchnical and LEgal aspects of data pRivacy and Security](#). Sep 2017

Bottomline:
Blockchain is ONE possible implementation of an immutable transparency layer, but not the only option!

	Local Log	Global Log + TTP	Global Log + P2P
Completeness	-	-	-
Confidentiality	MAC [2, 7, 14, 15], FssAgg [10], PKI [7, 10]	MAC [1, 6, 11, 12], PKI [20], unlinkability [6, 11, 12]	MAC [15], PKI[16], compound identities [15, 21]
Correctness	-	-	-
Immutability	cipher chains [2], hash chains [7, 15]	hash chains [7, 15]	network of peers [16, 19] blockchain [21]
Integrity	forward integrity [2, 7, 10, 14, 15] MAC security proof [2]	forward integrity [1, 6, 11, 12]	forward integrity [15]
Interoperability	-	-	-
Non-repudiation	-	-	-
Rectification & Erasure	-	-	-
Traceability	-	event trails [20]	-

Table 1. Candidate architectures and ledger functionality gap analysis

	Local Log	Global Log + TTP	Global Log + P2P
Availability	-	-	-
Performance	logging & verification [2, 7], signature generation & verification [10]	logging [11, 12], throughput [11, 12]	-
Scalability	encrypting records [7, 10]	-	-
Storage	key & signature [10]	resource restricted devices [1]	-

Table 2. Candidate architectures and ledger robustness gap analysis



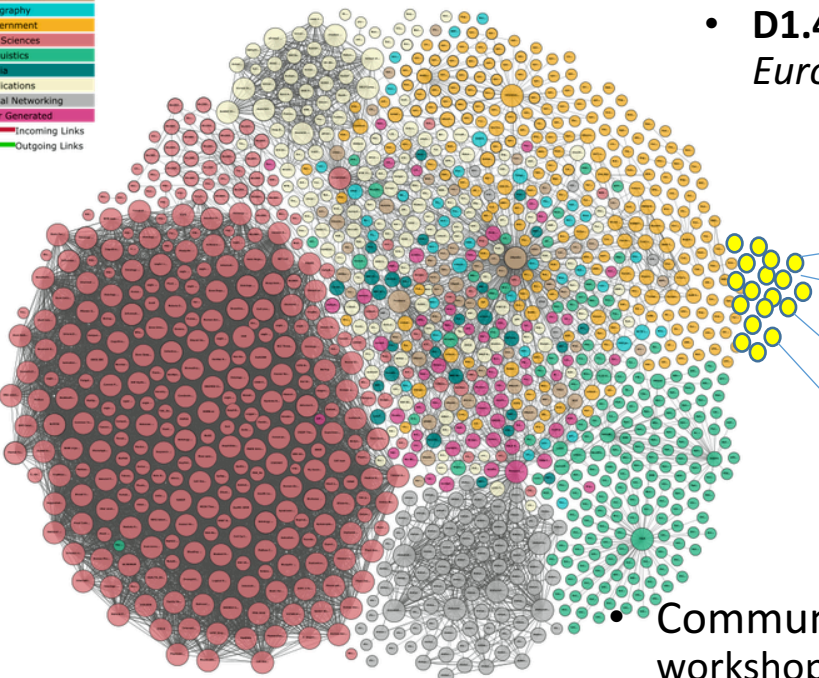
SPECIAL Results so far:

- 6 months into the project:
- Recent Publications:
 - **Self-Enforcing Access Control for Encrypted Linked Data.** Javier D. Fernández, Sabrina Kirrane, Axel Polleres, and Simon Steyskal. [Extended Semantic Web Conference \(ESWC 2017\)](#). May 2017
 - **Transparent Personal Data Processing: The Road Ahead.** Piero Bonatti, Sabrina Kirrane, Axel Polleres, and Rigo Wenning. [TELERISE: 3rd International Workshop on TEchnical and LEgal aspects of data pRivacy and Security](#). Sep 2017
- Next deliverables forthcoming:
 - **D1.3 Policy, transparency and compliance guidelines:** Requirements for an Ontology and Policy Language for formalizing and reasoning about Policies and Consent
 - **D1.4 Technical requirements:** First architecture blueprint, based on the BigData-Europe architecture (<https://www.big-data-europe.eu/>)
- Community building, common Standards and Best Practices: Planned W3C workshop and Community group on **Linked data Vocabularies for Transparency and Privacy controls (planned for early of 2018) – Please join us!**

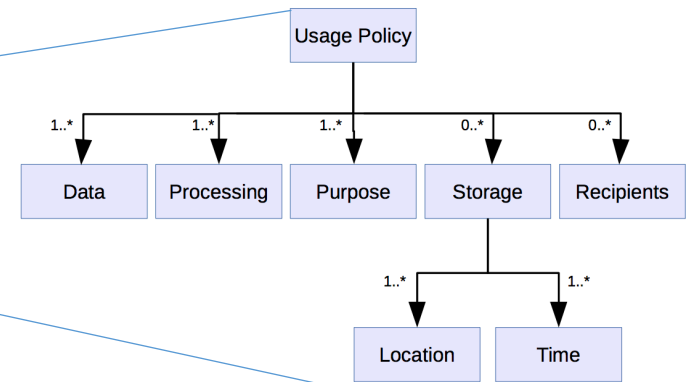


SPECIAL Results so far:

- Next deliverables forthcoming:
 - **D1.3 Policy, transparency and compliance guidelines:** Requirements for an Ontology and Policy Language for formalizing and reasoning about Policies and Consent
 - **D1.4 Technical requirements:** First architecture blueprint, based on the BigData-Europe architecture (<https://www.big-data-europe.eu/>)



e.g.
W3C ODRL/POE (2017)
W3C PROV (2013)



- **Community building, common Standards and Best Practices:** Planned W3C workshop and Community group on **Linked data Vocabularies for Transparency and Privacy controls** (planned for early of 2018) – Please join us!



Last, but not least:

Looking fwd to interesting 3 days here in Tallinn/Helsinki...

...and hope to see many of you in Vienna (**21-25 October**) for <http://iswc2017.semanticweb.org/>



WELCOME TO




MyData 2017

AUG 29th **AUG 30th** **AUG 31st** **SEP 1st**
Tuesday **Wednesday** **Thursday** **Friday**



HOME



Vienna
One of the most liveable cities in the world

IMPORTANT NEWS

- Startups wanted: check our Semantics In The Field event
- Early registration available until September 8
- Provisional program for Workshops and Tutorials
- All the ISWC calls are out!
- Sponsorship packages announced

SPONSORS

Platinum Sponsors



Web: <https://www.specialprivacy.eu/>

Twitter: @specialprivacy