Scalable Policy-aware linked data architecture for privacy, transparency and compliance

Results

Project Information

**SPECIAL**

Grant agreement ID: 731601

Project website [link]

**Status**

Closed project

**Funded under**

H2020-EU.2.1.1.

**Overall budget**

€ 3,991,388,75

**EU contribution**

€ 3,991,388,75

**Coordinated by**

GEIE ERCIM

France

This project is featured in...

RESEARCH*EU MAGAZINE

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Deliverables

Demonstrators, pilots, prototypes (17)

Formal representation of the legislation V1
Linked Data representation of the legislation and development of re-usable and extensible policy templates (T2.2).

Final release
The final release will incorporate all feedback from the inhouse robustness testing (T3.6), pilot evaluations (T5.1, T5.2), and hacking challenges (T5.3).

Pilot implementations and testing plans V1
The first pilot release will focus on privacy preserving data processing and aggregation functionality based on D3.2 & D4.1.

Policy Language V2
Development of the Policy Language syntax and algorithms to algorithms to synthesise policies for derived data (T2.1).

Transparency and Compliance Algorithms V2
Development of transparency and compliance algorithms (T2.4) to assure that any data processing is inline with the policies and the legislation (T2.1, T2.2), and to provide synthesis of policies for mined and aggregated data based on the user context, on top of the designed transparency framework (T2.3).

Transparency & compliance release
This release provides more mature components mainly the transparency components from T4.5 but also the improvements resulting from work in T3.3 and T3.4.

Formal representation of the legislation V2
Linked Data representation of the legislation and development of re-usable and extensible policy templates (T2.2).

Transparency dashboard and control panel release final release
The final release will incorporate all feedback from the inhouse robustness testing (T4.4), pilot evaluations (T5.1, T5.2), and hacking challenges (T5.3).

SPECIAL Website Setup
The SPECIAL website creation and release

Policy Language V1
Development of the Policy Language syntax and algorithms to algorithms to synthesise policies for derived data

**Transparency and Compliance Algorithms V1**
Development of transparency and compliance algorithms (T2.4) to assure that any data processing is inline with the policies and the legislation (T2.1, T2.2), and to provide synthesis of policies for mined and aggregated data based on the user context, on top of the designed transparency framework (T2.3).

**Transparency dashboard and control panel release V1**
This release will include policy and event data visualisation (T4.1) and system interaction (T4.2).

**Transparency dashboard and control panel release V2**
This release includes improvements to the policy and event data visualisation (T4.1) and system interaction (T4.2) and new visualisations to support the transparency and compliance functionality (T4.1 & T4.2).

**Initial setup of policy aware Linked Data architecture and engine**

**Policy & events release**
This release provides more mature components mainly the policy and synthesis management ones (outcomes of T3.4 on which WP3 first focusses). It will also integrate the progress made in the authentication and authorisation (T3.3).

**Transparency Framework V1**
Design of an immutable record of data transactions/transformations, associated to Linked Data access/usage policies (T2.3), which are outcomes og T2.1 and T2.2.

**Transparency Framework V2**
Design of an immutable record of data transactions/transformations, associated to Linked Data access/usage policies (T2.3), which are outcomes og T2.1 and T2.2.

**Documents, reports (19)**

**Use case scenarios V2**
Document detailing the use cases and data sharing scenarios provided by SPECIAL partners (T1.1).
Pilot implementations and testing plans V2
The second pilot release will extend the data processing and aggregation pilots with transparency and compliance functionality based on D3.4 & D4.3.

Public challenge report V2
The results of the public challenges (T5.3) will be documented and used to inform future releases of the platform (D3.6, D4.5).

Policy, transparency and compliance guidelines V1
This document will include details on the policy and transparency considerations of the use case, and the compliance requirements against policies.

Plan for community group and standardisation contribution
This document will set the basis for the SPECIAL consortium involvement in events/workshops (T6.2.1) and standardisation activities (T6.2.2).

Final Report of the Community Group
This report will collect the inputs from the reference group and the efforts of the community group (T6.2.2).

Public challenge report V1
The results of the public challenges (T5.3) will be documented and used to inform future releases of the platform (D3.4, D4.3, D3.6 & D4.5).

Technical requirements V2
Report on technical requirements and challenges (T1.4) that arise in extending the BDE architecture to cope with all privacy-aware SPECIAL requirements while assuring scalability and security.

Legal requirements for a privacy enhancing Big Data V2
This document will include details on the policy and transparency considerations of the use case, and the compliance requirements against policies (T1.3).

Report on application guideline
This report will present the findings of the pilots and future implementation plans by the industry partners and beyond.

Policy, transparency and compliance guidelines V2
This document will include details on the policy and transparency considerations of the use case, and the compliance requirements against policies (T1.3).

Technical requirements V1
Report on technical requirements and challenges that arise in extending the BDE architecture to cope with all privacy-aware SPECIAL requirements while assuring
scalability and security.

**Frontend Scalability and Robustness testing report V1**
The results of the usability testing (T4.4) will be documented and used to inform future releases of the platform (D4.3 & D4.5).

**Use case scenarios V1**
Document detailing the use cases and data sharing scenarios provided by SPECIAL partners

**Pilot implementations and testing plans V3**
The final pilots will be delivered at the same time as D3.6 & D4.5 and will incorporate all feedback from the inhouse robustness testing, pilot evaluations and hacking challenges.

**Usability testing report V2**
The results of the usability testing (T4.4) will be documented and used to inform future releases of the platform (D4.3 & D4.5).

**Backend Scalability and Robustness testing report V1**
The results of the scalability and robustness testing (T3.6) will be documented and used to inform future releases of the platform.

**Legal requirements for a privacy enhancing Big Data V1**
Report providing details of all legal and ethical considerations (T1.2), as a main input for the SPECIAL privacy-aware platform

**Scalability and Robustness testing report V2**
The results of the scalability and robustness testing (T3.6) will be documented and used to inform future releases of the platform (D3.4 & D3.6).

**Open Research Data Pilot (1)**

**Quality, risk and data management plan**
An evolving plan that describes the data management life cycle for the project data to be collected and processed along with quality and risk management procedures

**Publications**
Transparent Personal Data Processing: The Road Ahead

Author(s): Piero Bonatti, Sabrina Kirrane, Axel Polleres, Rigo Wenning
Published in: TELERISE: 3rd International Workshop on TEchnical and LEgal aspects of data pRivacy and Security, 2017, Page(s) 337-349
DOI: 10.1007/978-3-319-66284-8_28

LOD-a-lot. A Queryable Dump of the LOD Cloud

Author(s): Javier D. Fernández, Wouter Beek, Miguel A. Martínez-Prieto, Mario Arias
Published in: International Semantic Web Conference (ESWC 2017), Issue LNCS volume 10588, 2017, Page(s) 75-83
DOI: 10.1007/978-3-319-68204-4_7

LOD-a-lot: A Single-File Enabler for Data Science

Author(s): Wouter Beek, Javier D. Fernández, Ruben Verborgh
Published in: SEMANTiCS 2017, 2017, Page(s) 181-184

A New Semantics for Overriding in Description Logics

Author(s): Piero A. Bonatti, Marco Faella, Iliana M. Petrova, Luigi Sauro
Published in: Proceedings of IJCAI-17, 2017, Page(s) 4975-4979

Designing a GDPR-compliant and Usable Privacy Dashboard

Author(s): Philip Raschke, Axel Küpper, Olha Drozd and Sabrina Kirrane
Published in: IFIP Summer School 2017, 2018

Evaluating Query and Storage Strategies for RDF Archives

Author(s): Javier D. Fernández, Jürgen Umbrich, Axel Polleres, and Magnus Knuth
Published in: Semantic Web Journal, 2018

HDTQ: Managing RDF Datasets in Compressed Space

Author(s): Javier D. Fernández and Axel Polleres
Published in: Extended Semantic Web Conference (ESWC 2018), 2018

A Scalable Consent, Transparency and Compliance Architecture
Fast Compliance Checking in an OWL2 Fragment

Author(s): Piero A. Bonatti
Published in: Proceedings of the Twenty-Seventh International Joint Conference on Artificial Intelligence, 2018, Page(s) 1746-1752
DOI: 10.24963/ijcai.2018/241

Legislative Compliance Assessment: Framework, Model and GDPR Instantiation

Author(s): Sushant Agarwal, Simon Steyskal, Franjo Antunovic and Sabrina Kirrane
Published in: Proceedings of the Annual Privacy Forum (APF 2018), 2018

Uncovering Canvas Fingerprinting and Analyzing Its Usage For Web Tracking

Author(s): Raschke, P. and Küpper, A
Published in: Workshops der Informatik 2018. Lecture Notes in Informatics (LNI)., 2018

Towards Making Distributed RDF Processing FLINKer

Author(s): Amr Azzam, Sabrina Kirrane, Axel Polleres
Published in: International Conference on Big Data Innovations and Applications (Innovate-Data 2018, 2018

Data Privacy Vocabularies and Controls: Semantic Web for Transparency and Privacy

Author(s): Piero A. Bonatti, Bert Bos, Stefan Decker, Javier D. Fernández, Sabrina Kirrane, Vassilios Peristeras, Axel Polleres, and Rigo Wenning
Published in: Semantic Web for Social Good (ISWC2018 Workshop), 2018

SPIRIT: A Semantic Transparency and Compliance Stack

Author(s): Patrick Westphal, Javier Fernández, Sabrina Kirrane and Jens Lehmann
Published in: Proceedings of the Posters and Demos Track of the 14th International Conference on Semantic Systems (SEMANTiCS 2018), 2018

Enabling Personal Data Processing Control via Dynamic Consent
Author(s): Olha Drozd, Rigo Wenning and Sabrina Kirrane  
Published in: OPERANDI 2018: Open Day for Privacy, Transparency and Decentralization (PETS2018), 2018

Fast Compliance Checking with General Vocabularies  
Author(s): P. A. Bonatti, L. Ioffredo, I. M. Petrova, L. Sauro  
Published in: ESWC 2020, 2019

Big Data and Analytics in the Age of the GDPR  
Author(s): Piero Bonatti and Sabrina Kirrane  
Published in: IEEE Computer Society, 2019, 2019

Big Data and Analytics in the Age of the GDPR  
Author(s): Piero A. Bonatti, Sabrina Kirrane  
Published in: TBA, 2019

A More Decentralized Vision for Linked Data  
Author(s): Axel Polleres, Javier Fernández  
Published in: Proceedings of the 2nd Workshop on Decentralizing the Semantic Web co-located with the 17th International Semantic Web Conference, DeSemWeb@ISWC, CEUR-2165, paper 1, 2018, 2018

Consent Comprehension Made EasyDemo  
Author(s): Olha Drozd and Sabrina Kirrane  
Published in: Open Day for Privacy, Usability, and Transparency (PUT 2019), 2019

ODRL policy modelling and compliance checking  
Author(s): Marina De Vos, Sabrina Kirrane, Julian Padget and Ken Satoh  
Published in: 3rd International Joint Conference on Rules and Reasoning (RuleML+RR 2019), 2019

Machine Understandable Policies and GDPR Compliance Checking  
Author(s): Piero A. Bonatti, Sabrina Kirrane, Iliana M. Petrova, Luigi Sauro  
Published in: Kuenstliche Intelligenz, 2019
I Agree: Customize your Personal Data Processing with the CoRe User Interface.

Author(s): Olha Drozd and Sabrina Kirrane
Published in: 6th International Conference on Trust, Privacy and Security in Digital Business, 2019

Real-Time Reasoning in OWL2 for GDPR Compliance.

Author(s): P.A. Bonatti, L. Ioffredo, I.M. Petrova, L. Sauro, I.R. Siahaan
Published in: Artificial intelligence Journal, 2019

On the logical properties of the nonmonotonic description logic DL^N

Author(s): P. A. Bonatti
Published in: 2018

Privacy-aware Linked Widgets

Author(s): Javier D. Fernández, Fajar J. Ekaputra, Peb Ruswono Aryan, Amr Azzam, Elmar Kiesling.

Towards Real-Time Web Tracking Detection with T.EX - The Transparency EXtension

Author(s): Raschke P., Zickau S., Kröger J.L., Küpper A.

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

Published in: 2019

Self-Enforcing Access Control for Encrypted RDF

Author(s): Javier D. Fernández, Sabrina Kirrane, Axel Polleres, Simon Steyskal
Published in: Extended Semantic Web Conference (ESWC 2017), Issue volume = {10249} year = {2017}, 2017, Page(s) 607-622, ISSN 1611-3349
DOI: 10.1007/978-3-319-58068-5_37