

Detecting context-change in consent & data lifecycles for GDPR compliance

PhD Researcher

Theme E1

Supervised by Dave Lewis

Co-Supervised by Declan O'Sullivan

GDPR

General Data Protection Regulation

- New regulation, replaces previous Data Protection Regulation
- In effect from 25th May 2018
- Fines up to 20 million euros or 4% of global turnover, whichever is HIGHER
- Requires 'informed' and 'explicit' consent that specifies -
 - What data is going to be collected?
 - For what purposes?
 - For how long?
 - Shared with whom and why?

^^^ PROVENANCE ^^^

GDPRov

GDPR Provenance Ontology

(paper submitted at PrivOn workshop at ISWC17)

- Extends PROV-O (W3C recommendation) and P-Plan (extension of PROV-O)
 - Expresses consent and data lifecycles as provenance 'activities' and 'entities'
 - Uses OWL2 constraints and relationships to model rudimentary GDPR requirements
 - Allows expressing 'process' of how consent & data are-
 - Acquired
 - Used
 - Shared
 - Stored
 - Deleted
 - Query using SPARQL
-

GDPROv

Ongoing and Future Work

- Add more 'details' to the ontology based on GDPR requirements and terminology
 - Create representative SPARQL queries for compliance based on what information is needed
 - To be extracted or retrieved
 - For checking a condition or constraint
-

GDPR-tEXT

Extending GDPR text with
annotations

- GDPR is a legal resource (all text)
 - Convert to 'referenceable' resource for use with LOD ontologies
 - Annotations over text
 - Use-cases
 - Link a particular compliance query to relevant clauses that dictate the restrictions in that query
 - Provide a 'checklist' of compliance clauses
 - Useful for ontologies based on GDPR
 - Link a particular term to its definition
-

GDPR specifies renewing consent

- In a timely fashion, i.e. periodically
- If terms of service change
- If the intended usage of data changes
- If any parameters associated with data change
 - Storage
 - Sharing with Third-party

^^^ change in provenance of
consent & data lifecycles ^^^



To what extent can
GDPR compliance be evaluated
based on
provenance of consent and data lifecycles
expressed using
semantic web ontologies?

work-in-progress research question

Changes in Provenance Graphs

- Detect change in provenance graph
 - Classify change as context change based on use of consent and data
 - Calculate whether this should result in asking for new consent from the user
 - Evaluate use of provenance ontologies, graph algorithms
-

Constraints

Expressing GDPR compliance requirements as constraints over provenance graphs

- Evaluate the use of SPIN/SWRL as well as SHACL to specify constraints over provenance graphs of consent and data lifecycles.
 - The constraints can then be queried using SPARQL or expressed as reports in the case of SHACL
-

Compliance Queries

- Use SPIN to record queries
 - Do queries over queries!
 - Express compliance as a set of (meta-)queries over
 - Provenance graphs
 - Constraints
 - Changes in provenance graphs
-

fine
per oggi