

# **Solid - Data Interoperability Panel User Profile Use Case & CCO**

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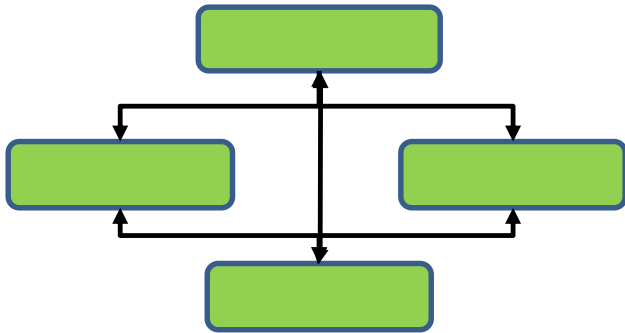
# My Aim Today is ...

- Our Proposed Use Case
  - Enabling interoperability amongst applications/data via use of a standard upper-level ontology along with shared modular extensions.
- Intro to the Common Core Ontologies
- What's Next..

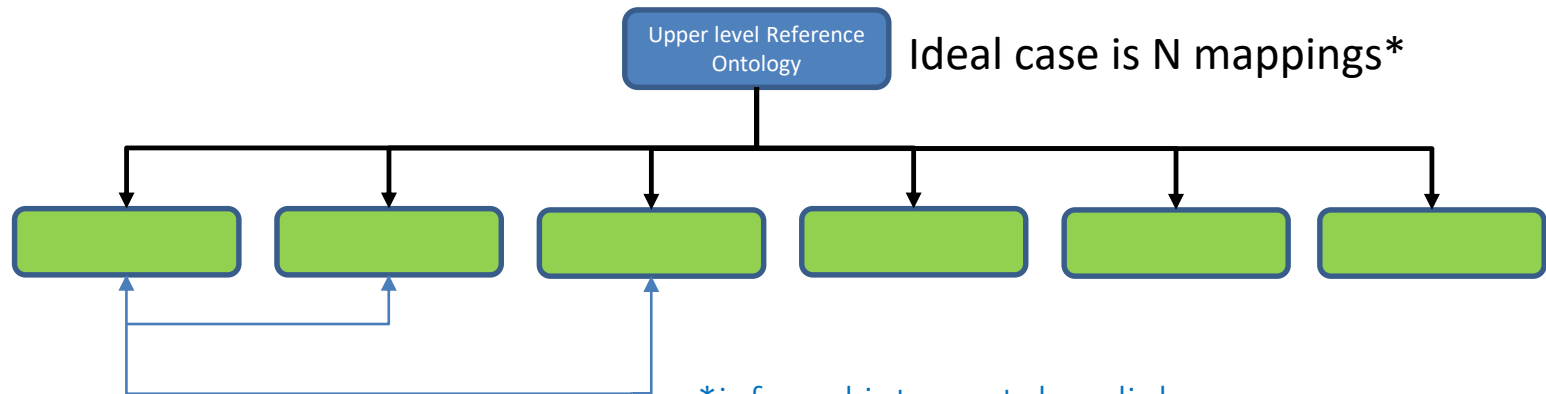
# Use Case

- Described here:
  - <https://github.com/solid/data-interoperability-panel/issues/24>
- More here:
  - <https://github.com/solid/data-interoperability-panel/pull/14>
- Use of modular extension ontologies supports interoperability better than shapes alone, more extensible than enforcing common data models
  - A step closer to automating integration

# Mapping Chaos



Worse case is  $N^2 - N$  mappings



Ideal case is  $N$  mappings\*

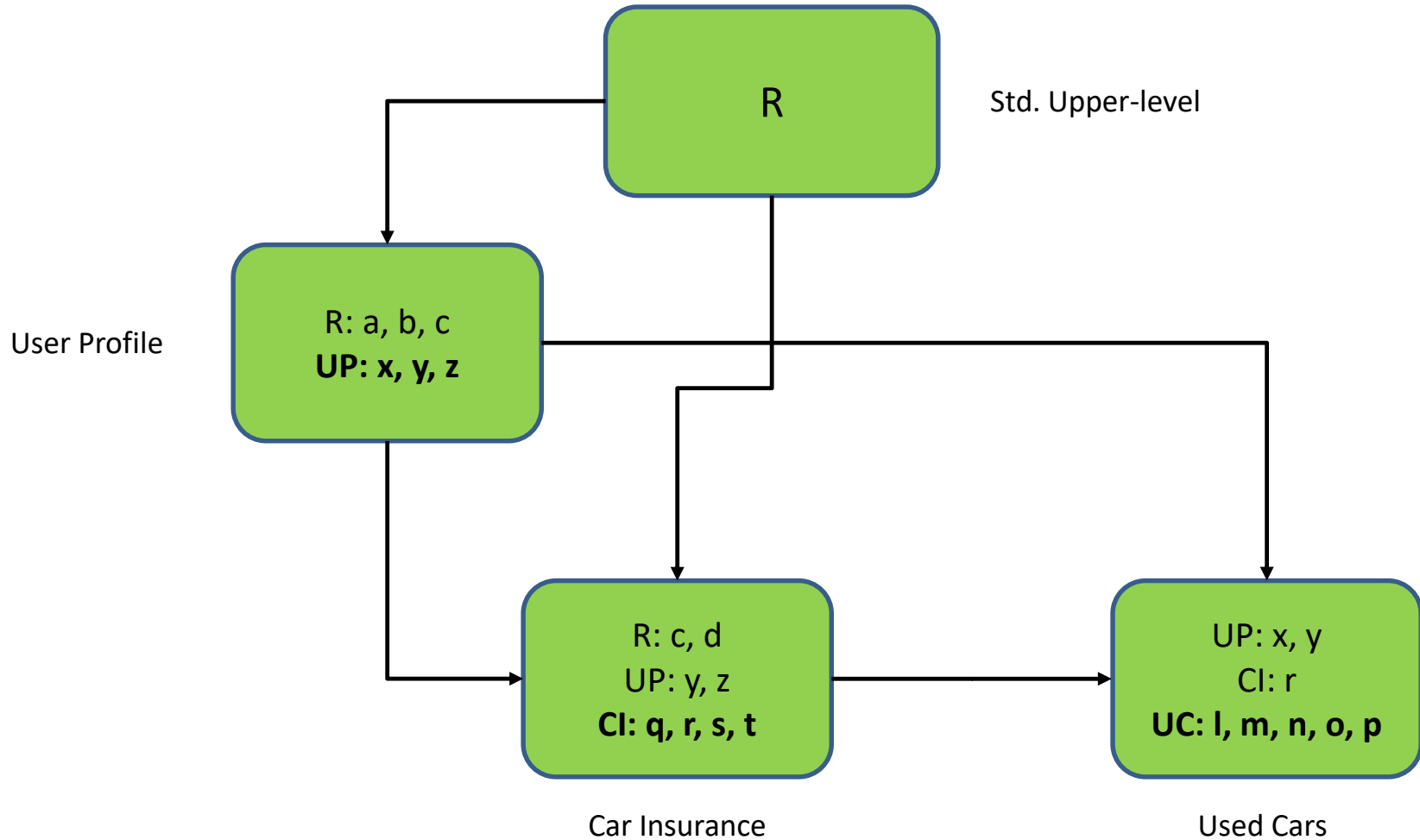
\*inferred inter-ontology linkages

\* Adapted from: <https://douroucouli.wordpress.com/2019/05/27/never-mind-the-logix-taming-the-semantic-anarchy-of-mappings-in-ontology/>

# Use Case – Modular Extension

- User Profile data encoded using Ontology UP, which extends from Ontology R.
- Developer A has application for obtaining Car Insurance quotes, creates Ontology CI, a module that extends from UP and R.
- Developer B has application for buying & selling used cars, creates Ontology UC, reuses and inherits from UP and CI.

# Extension: Reuse and Inheritance



# Use Case – Current Status

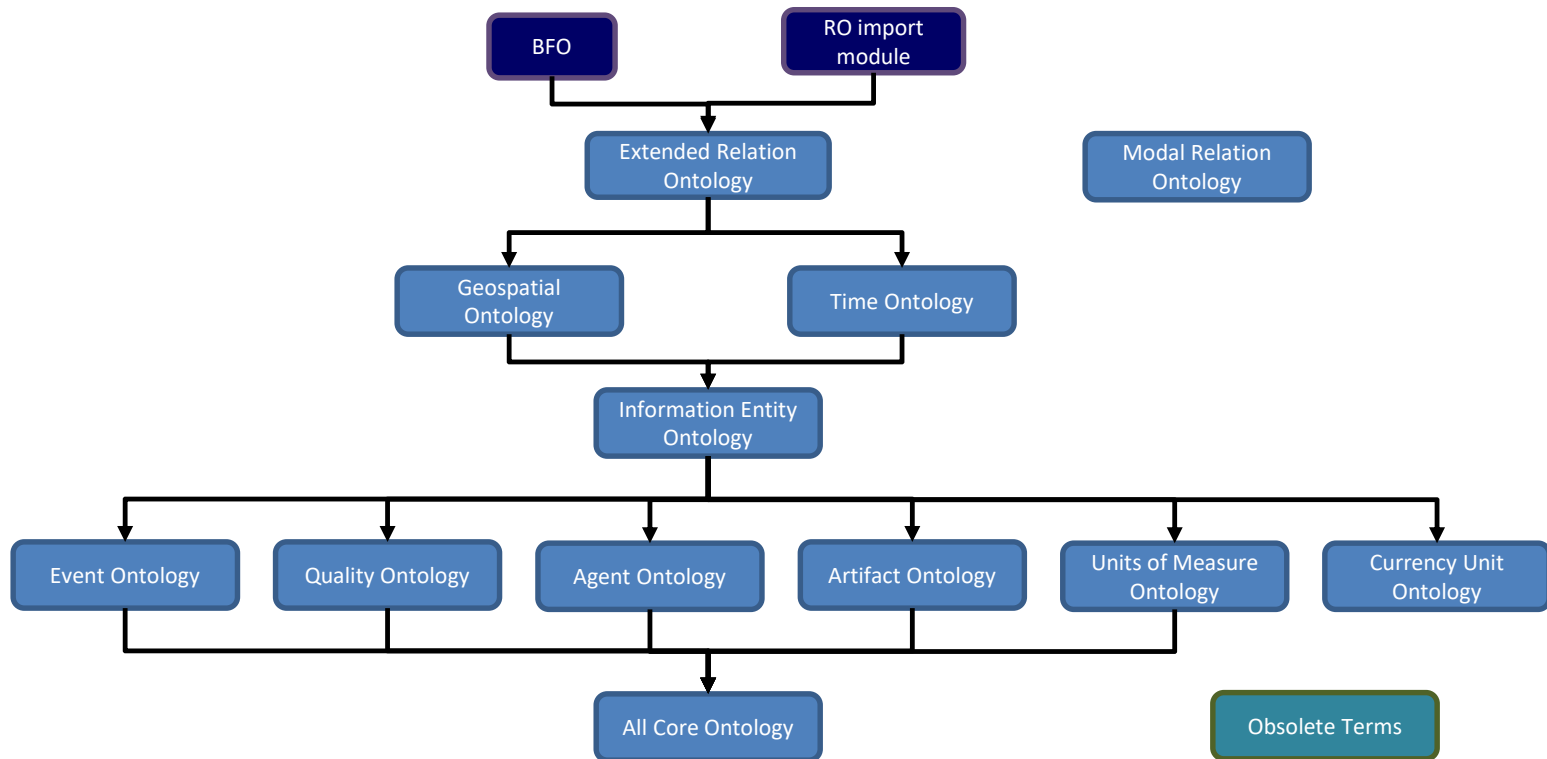
- Sample RDF for user Jane Doe
  - Baseline contact info
- List of terms used to structure profile data
- User Profile Ontology
  - Auto-generated module, logical closure of term list
- Shape\*
- Available here:
  - <https://github.com/CommonCoreOntology/UserProfileOntology>

# The Common Core Ontologies

- Developed by CUBRC since 2010
  - Funding typically supports building domain ontologies. The “core” is relatively stable.
  - Extends BFO (now an ISO standard) and RO.
- Purpose: Enable alignment of data through rule-based extensions of upper/mid-level ontologies
  - Reduce semantic heterogeneity among domain ontologies
  - Improve precision, recall of cross-source queries
  - Reduce development costs by facilitating reuse

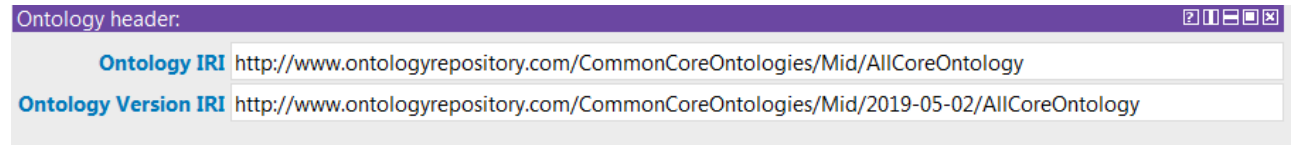


# The Common Core Ontologies Import Structure



# Best Practices

- Versioning



| Ontology header:     |   | ⌵ ⌴ ⌵ ⌴ |
|----------------------|---|---------|
| Ontology IRI         | http://www.ontologyrepository.com/CommonCoreOntologies/Mid/AllCoreOntology            |         |
| Ontology Version IRI | http://www.ontologyrepository.com/CommonCoreOntologies/Mid/2019-05-02/AllCoreOntology |         |

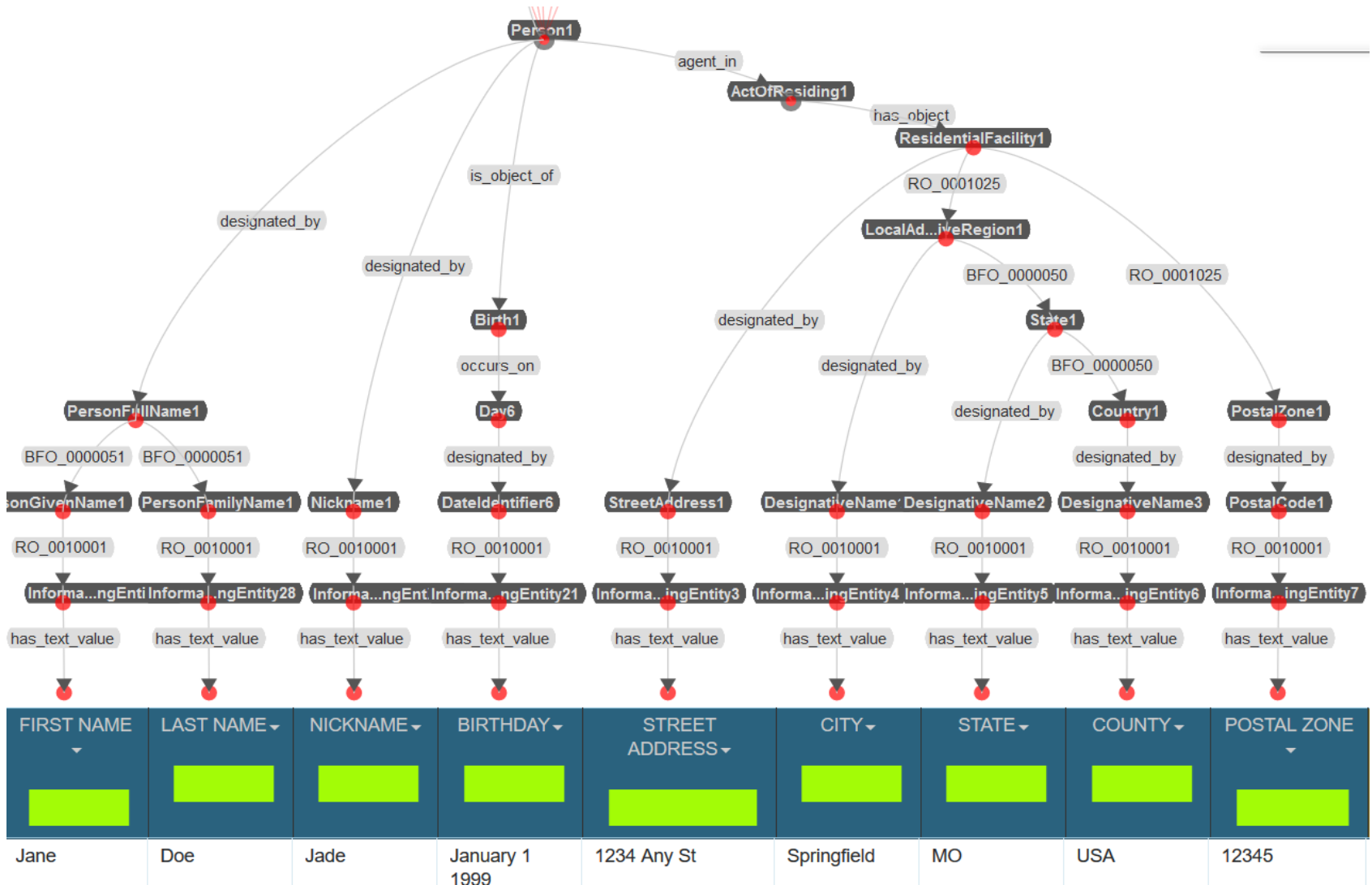
- Open sourced in November 2017
  - Public Repository
    - <https://github.com/CommonCoreOntology/CommonCoreOntologies>
  - Creative Commons BY 3.0 & 3-Clause BSD
- Documentation (available in repo)
  - Two documents describing the content and use of the CCO
  - Each major release includes list of changes since last release
- Commitment to Collaboration
  - Issue tracking
  - Participating in development of OBO-core

# Best Practices

- Naming Conventions, Textual Definitions, Metadata

```
### http://www.ontologyrepository.com/CommonCoreOntologies/Government
cco:Government rdf:type owl:Class ;
               rdfs:subClassOf cco:Organization ,
               [ rdf:type owl:Restriction ;
                 owl:onProperty cco:is_delimited_by ;
                 owl:someValuesFrom cco:GeopoliticalEntity
               ] ;
               cco:definition "An Organization that exercises executive, legislative, or judicial authority
over a Geopolitical Entity."^^xsd:string ;
               cco:definition_source "https://en.wikipedia.org/wiki/Government"^^xsd:string ;
               cco:is_curated_in_ontology "
http://www.ontologyrepository.com/CommonCoreOntologies/Mid/AgentOntology"^^xsd:string ;
               rdfs:label "Government"^^xsd:string .
```

# Data Modeling and Alignment



# What's Coming Next

- User Profile creation application
  - Enter personal data to set up User Profile
- Use Cases / Demos
  - Proposed here: <https://github.com/solid/data-interoperability-panel/issues/24>
  - Looking for feedback from the community
  - Demos to the community

# What's Coming Next

- Complete User Profile shapes
- Tools for developers to convert from vCard, FOAF, and other popular ontologies
- Continued community involvement and focus on data interoperability

# Thanks!

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