Development of the Share-VDE ontology: goals, principles, and process

Oddrun Ohren
OhrenOddrun.Ohren@nb.no
National Library of Norway

Jim Hahn
University of Pennsylvania
University of Illinois
jimhahn@upenn.edu

Tiziana Possemato
@Cult/Casalini
tiziana.possemato@atcult.it

SPECIAL THANKS

I'd like to begin by acknowledging the work of the Share-VDE Sapientia Entity Identification (SEI) WG which has been dedicated to describing in the ontology web language (OWL) a SVDE Ontology.

The British Library Alan Danskin, Corine Deliot
Library of Congress Kevin Ford, Nate Trail
National Library of Finland Marja-Liisa Seppälä
National Library of Medicine Nancy Fallgren
National Library of Norway Oddrun Ohren, Trine Adolfsen
New York University Charlene Chou, Everett Allgood
Smithsonian Libraries and Archives Jackie Shieh
Stanford University Libraries Nancy Lorimer
University of Alberta Library Danoosh Davoodi, Ian Bigelow
University of Chicago Libraries Thomas Dousa
University of Pennsylvania Libraries Jim Hahn, Chair
Vanderbilt University Library Alicia C. Zalusky
Yale University Library Youn Noh, Timothy Thompson

Share-VDE Discovery

The Share-VDE discovery environment is a linked data search system that uses the BIBFRAME vocabulary for describing bibliographic entities.

Search: https://svde.org

Share-VDE Ontology needs

The Share-VDE system is a federated search environment.

This led to a need for additional entities that compliment BIBFRAME for federated search.

Considered the needs of BIBFRAME when clustering works.

BIBFRAME

The BIBFRAME ontology uses a core three-level hierarchy to describe the bibliographic universe.

BIBFRAME core classes

Work: in the BIBFRAME context, reflects the conceptual essence of the cataloged resource: authors, languages, and what it is about (subjects).

Instance: A Work may have one or more individual, material embodiments, for example, a particular published form. These are *Instances* of the Work.

Item: is an actual copy (physical or electronic) of an Instance. It reflects information such as its location (physical or virtual), shelf mark, and barcode.

THE Share-VDE ONTOLOGY

The Share-VDE Ontology supports the Share family of projects (based in federated linked data discovery environments) and is developed as an extension to BIBFRAME.

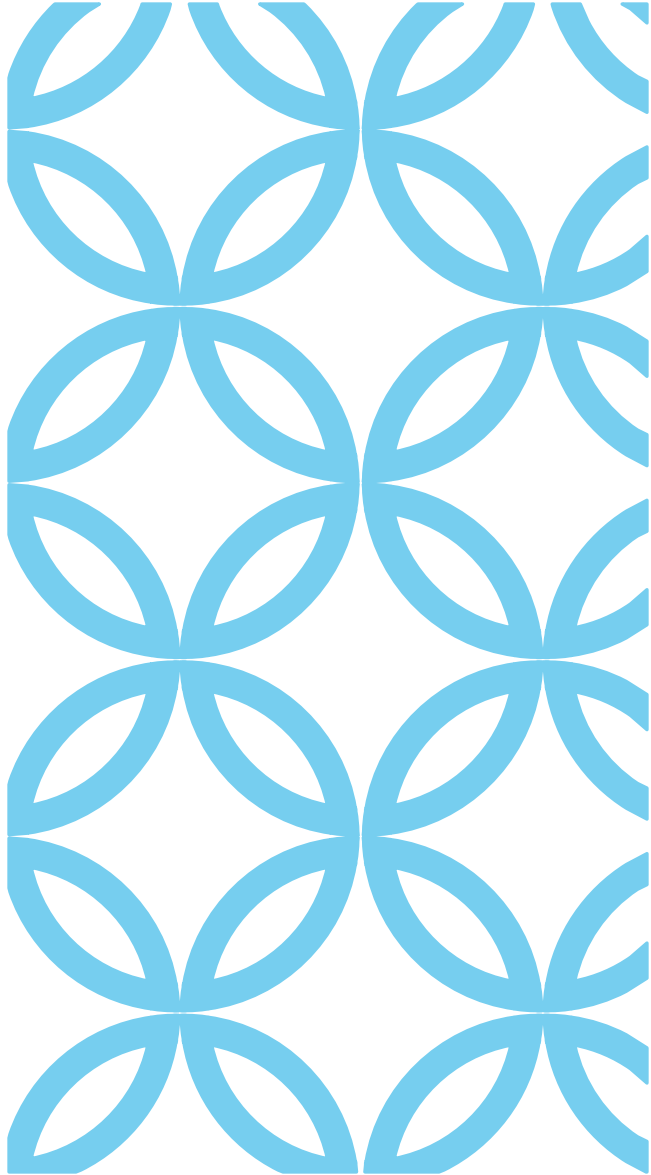This presentation will describe the design process, including goals and principles.

GOALS

1) use web ontology language (OWL) to publish the classes, properties and constraints that are used in the Share family of project;

2) clarify the relationship among Share-VDE entities and other linked data vocabularies and

3) provide internal (to SVDE) and external (to BIBFRAME) consistency and clarity to classes and properties used in SVDE.

An overarching design principle is to reduce complexity and clarify Share-VDE entities used in a search system.
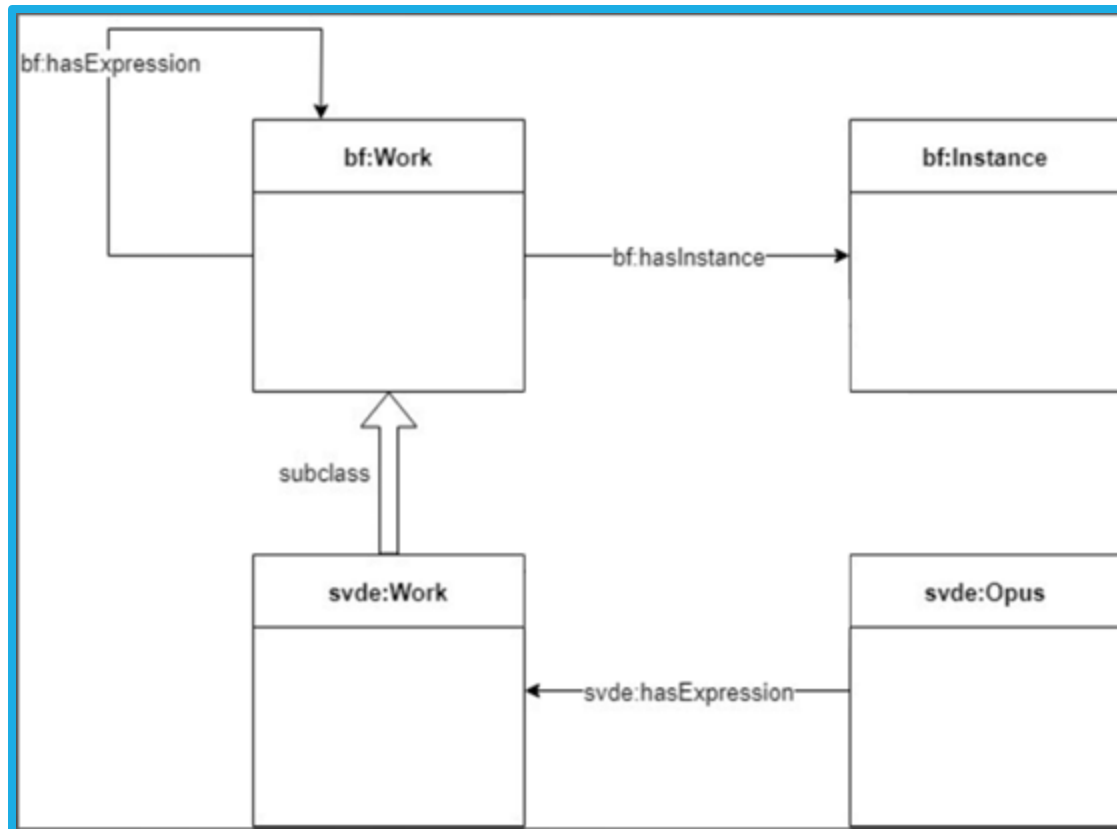
PRINCIPLES

EDITING THE ONTOLOGY

The ontology editing process began by evaluating existing SVDE classes and documenting in OWL; moving next to properties; finally, the process concluded by evaluating any needed restrictions for entities.
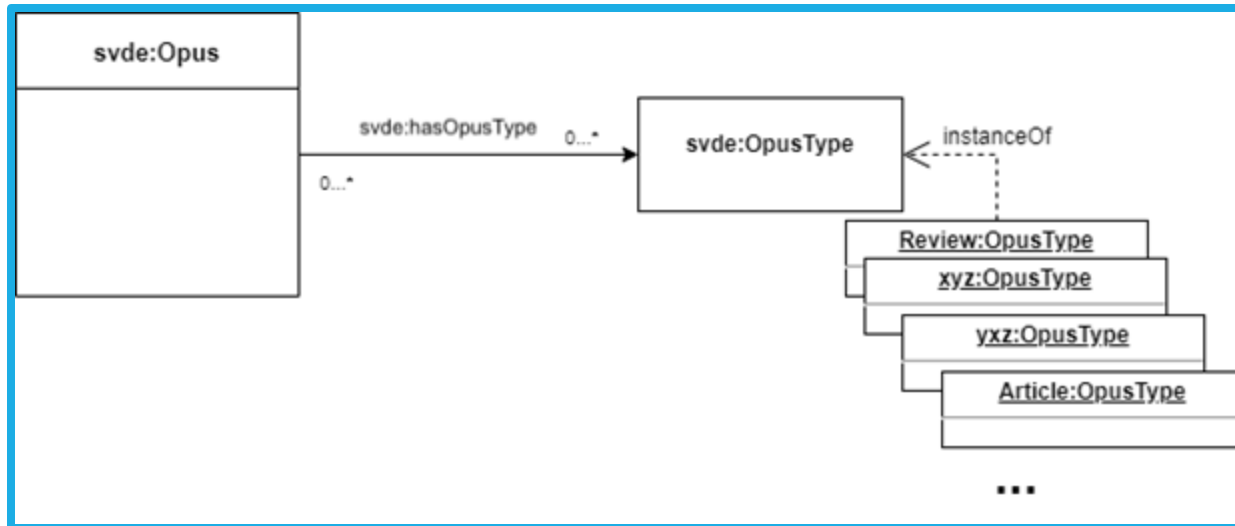
evaluate existing classes → add object properties → declare restrictions

CONCEPTUAL DIAGRAMS TO OWL RDF/XML

Core model:
svde:Work,
svde:Opus,
svde:hasExpression

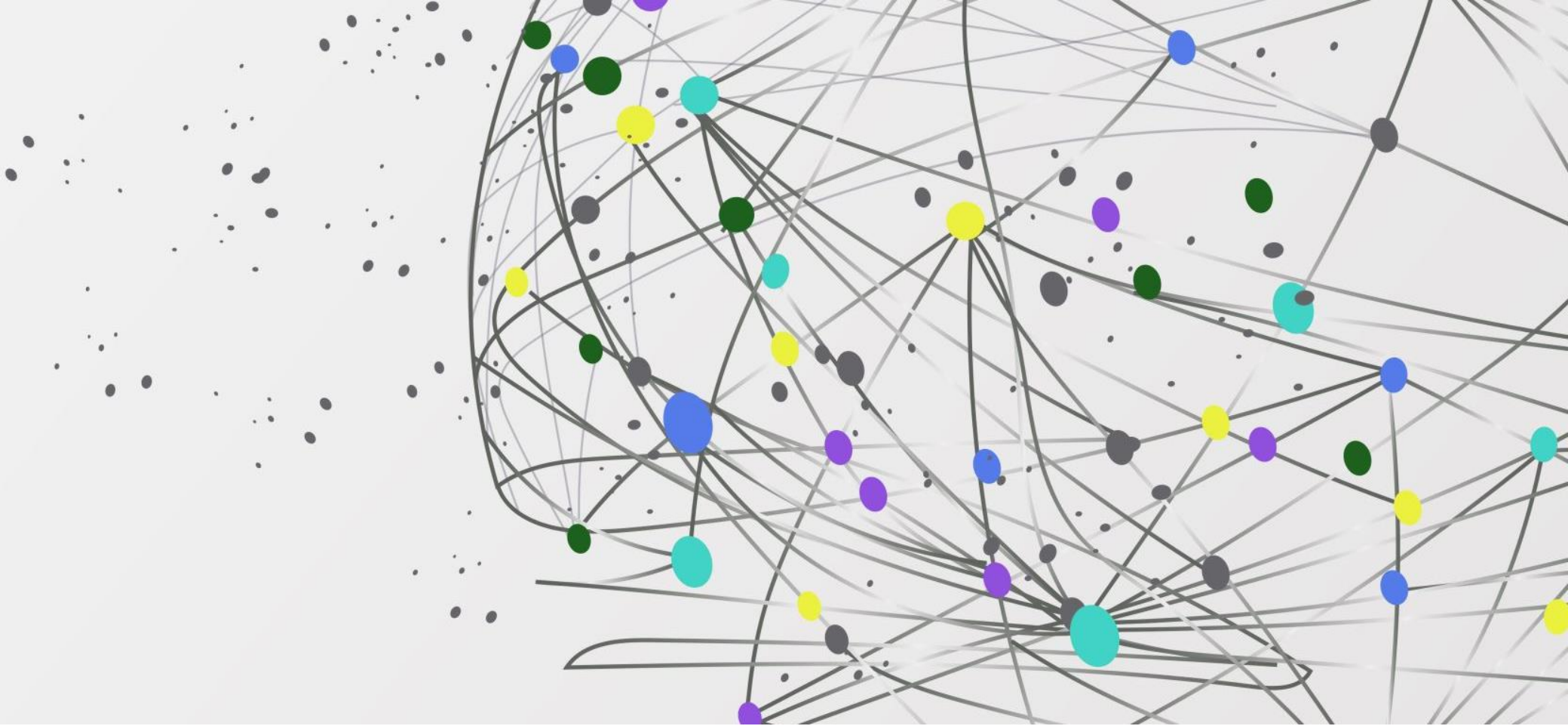# CONCEPTUAL DIAGRAMS TO OWL RDF/XML

Core model:
**svde:OpusType,
svde:hasOpusType**

SVDE RDF/XML CORE CLASS

```xml
<!-- https://svde.org/ontology/Work -->

<Class rdf:about="https://svde.org/ontology/Work">
    <rdfs:subClassOf rdf:resource="http://id.loc.gov/ontologies/bibframe/Work"/>
    <rdfs:label>Work</rdfs:label>
    <skos:definition>The svde:Work is defined by a constellation of elements
representing the specific intellectual or artistic form that an Opus takes each time
it is "realised." Individuals of the class svde:Work hold an Opus entity
identity.</skos:definition>
    <svde:closeMatch rdf:resource="http://iflastandards.info/ns/lrm/lrmer/E3"/>
    <svde:closeMatch rdf:resource="http://rdaregistry.info/Elements/c/C10006"/>
</Class>
```

svde:Work

The svde:Work is defined by a constellation of elements representing the specific intellectual or artistic form that an Opus takes each time it is "realised."

svde:Opus

The svde:Opus is a distinct conceptual outcome of artistic or intellectual activity. The highest level of abstraction in Share-VDE, an Opus is an entity that permits the grouping of works that are considered functional or near equivalents.

SVDE RDF/XML CORE CLASS

```xml
<!-- https://svde.org/ontology/Opus -->

<Class rdf:about="https://svde.org/ontology/Opus">
    <disjointWith rdf:resource="https://svde.org/ontology/Work"/>
    <terms:relation rdf:resource="http://id.loc.gov/ontologies/bibframe/Hub"/>
    <rdfs:label>Opus</rdfs:label>
    <skos:definition>The svde:Opus is a distinct conceptual outcome of artistic or
intellectual activity. The highest level of abstraction in Share-VDE, an Opus is an entity
that permits the grouping of works that are considered functional or near equivalents. The
Opus is defined by a constellation of elements that form the shared content of works and
provides a grouping for svde:Work entities.</skos:definition>
    <skos:note>The svde:Opus class is not the same as the bf:Hub class.</skos:note>
    <skos:scopeNote>The Opus may be a piece of art, literature, music, a scientific result,
or a creation within some other artistic or intellectual domain.</skos:scopeNote>
    <svde:closeMatch rdf:resource="http://iflastandards.info/ns/lrm/lrmer/E2"/>
    <svde:closeMatch rdf:resource="http://rdaregistry.info/Elements/c/C10001"/>
</Class>
```

SVDE RDF/XML CORE CLASS

```xml
<!-- https://svde.org/ontology/Opus -->

<Axiom>
    <annotatedSource rdf:resource="https://svde.org/ontology/Opus"/>
    <annotatedProperty rdf:resource="http://purl.org/dc/terms/relation"/>
    <annotatedTarget
rdf:resource="http://id.loc.gov/ontologies/bibframe/Hub"/>
    <skos:comment>While the bf:Hub and svde:Opus are not the same, there is
a relation among these classes in the sense they gather bf:Work entities by
bf:hasExpression/svde:hasExpression, respectively.</skos:comment>
</Axiom>
```

svde:OpusType

Individuals of the OpusType class support identification of Opus categories.

SVDE RDF/XML CORE CLASS

```
<!-- https://svde.org/ontology/OpusType -->

<Class rdf:about="https://svde.org/ontology/OpusType">
    <rdfs:label>OpusType</rdfs:label>
    <skos:definition>Individuals of the OpusType class support
identification of Opus categories.</skos:definition>
</Class>
```

svde:hasExpression

Relates the Opus to the Work

SVDE RDF/XML OBJECT PROPERTIES

```xml
<!-- https://svde.org/ontology/hasExpression -->

<ObjectProperty rdf:about="https://svde.org/ontology/hasExpression">
    <rdfs:domain rdf:resource="https://svde.org/ontology/Opus"/>
    <rdfs:range rdf:resource="https://svde.org/ontology/Work"/>
    <rdfs:label>hasExpression</rdfs:label>
    <svde:closeMatch
rdf:resource="http://iflastandards.info/ns/lrm/lrmer/R2"/>
    <svde:closeMatch
rdf:resource="http://rdaregistry.info/Elements/w/P10078"/>
</ObjectProperty>
```

svde:hasOpusType

Relates the Opus to the OpusType.

SVDE RDF/XML OBJECT PROPERTIES

```
<!-- https://svde.org/ontology/hasOpusType -->

<ObjectProperty rdf:about="https://svde.org/ontology/hasOpusType">
    <rdfs:subPropertyOf rdf:resource="https://svde.org/ontology/hasType"/>
    <rdfs:domain rdf:resource="https://svde.org/ontology/Opus"/>
    <rdfs:range rdf:resource="https://svde.org/ontology/OpusType"/>
    <rdfs:label>hasOpusType</rdfs:label>
</ObjectProperty>
```

svde:hasType

The svde:hasType is an intermediate property that may be specialized by entity.

SVDE RDF/XML OBJECT PROPERTIES

```
<!-- https://svde.org/ontology/hasType -->

<ObjectProperty rdf:about="https://svde.org/ontology/hasType">
    <rdfs:subPropertyOf
rdf:resource="http://rdaregistry.info/Elements/u/P60944"/>
    <rdfs:label>hasType</rdfs:label>
    <skos:definition>The svde:hasType is an intermediate property that may
be specialized by entity.</skos:definition>
</ObjectProperty>
```

svde:inHub

A bf:Hub may be related to one or many svde:Works.

SVDE RDF/XML OBJECT PROPERTIES

```
<!-- https://svde.org/ontology/inHub -->

<ObjectProperty rdf:about="https://svde.org/ontology/inHub">
    <rdfs:subPropertyOf
rdf:resource="http://id.loc.gov/ontologies/bibframe/relatedTo"/>
    <svde:usageNote>A bf:Hub may be related to one or many
svde:Works.</svde:usageNote>
    <svde:useDomain>svde:Work</svde:useDomain>
    <svde:useRange>bf:Hub</svde:useRange>
</ObjectProperty>
```

svde:closeMatch

Refers to a semantically similar entity (typically class or property) in another ontology or scheme.

SVDE RDF/XML ANNOTATIONS

```xml
<!-- https://svde.org/ontology/closeMatch -->

<AnnotationProperty rdf:about="https://svde.org/ontology/closeMatch">
    <rdfs:label>close match to</rdfs:label>
    <skos:definition>Refers to a semantically similar entity (typically
class or property) in another ontology or scheme.</skos:definition>
    <rdfs:subPropertyOf rdf:resource="http://purl.org/dc/terms/relation"/>
</AnnotationProperty>
```

https://doi.org/10.5281/zenodo.8332350

ACCESS THE SHARE-VDE ONTOLOGY (pre-release)

Conclusions

Access pre-release of the ontology:

https://doi.org/10.5281/zenodo.8332350

The **Share-VDE ontology** was designed to support the discovery needs of BIBFRAME based entity search. Overall significance of the project is to support federated linked data discovery.

Key finding from working with the BIBFRAME ontology is that most of the ontology can be the basis for linked data discovery. The SVDE extension is suited **especially where federated systems are** concerned.

The Share-VDE ontology **provides RDA correspondences** but not direct mappings among a selection of BIBFRAME and RDA core classes.