

Enhancing Interoperability of FRBR-based Metadata

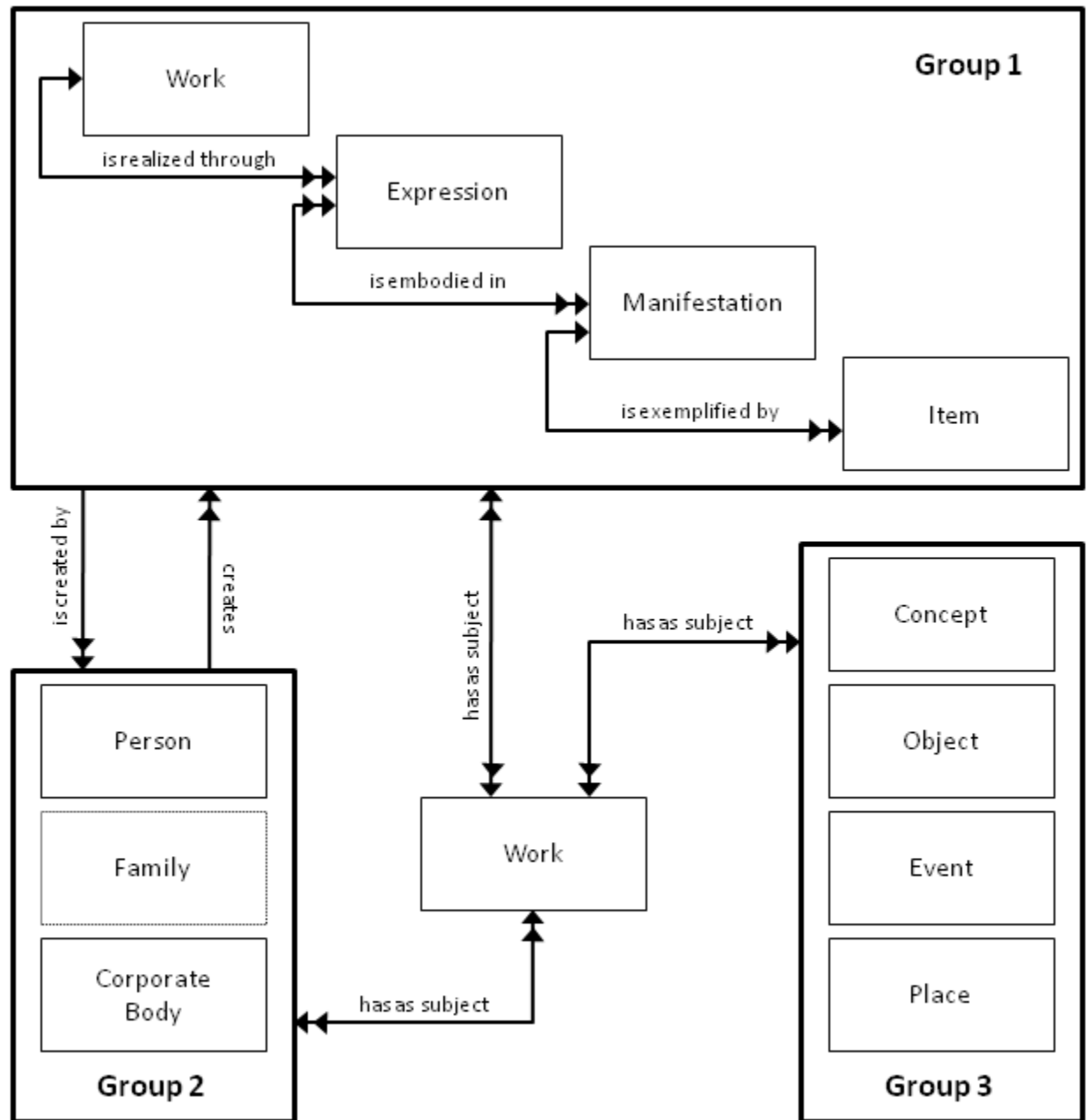
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»» FRBR and the V/FRBR Project

V/FRBR project @ Indiana U.

- ▶ Concrete testbed for FRBR, using music (scores/recordings) as an example
- ▶ Model for next-generation catalogs
- ▶ Investigate FRBRized cataloging interfaces
- ▶ *Develop data model that embodies FRBR principles*
 - Obviously this data must be interoperable
 - Opportunity to take advantage of data modeling work outside of libraries

(selected) FRBR/FRAD entities & relationships



How literally to take FRBR attributes?

4.2 Attributes of a Work

The logical attributes of a *work* defined for this study are the following:

- title of the *work*
- form of *work*
- date of the *work*
- other distinguishing characteristic
- intended termination
- intended audience
- context for the *work*
- medium of performance (musical work)
- numeric designation (musical work)
- key (musical work)
- coordinates (cartographic work)
- equinox (cartographic work)

Looking for guidance

	Focus on music?	Strictness of FRBR usage	Formal specifications public?
Probado (Bavarian State Library)		—	
Music Australia		—	
Music Ontology			
Variazioni (European version; not Indiana's)		—	
DCMI/RDA Task Group			
SWAP		—	—

Current status of data modeling activities

- ▶ Lightweight specification in Excel
 - Listing formally all entities/attributes/relationships in FRBR/FRAD
 - Adding some features our project team believes are necessary to make FRBRized data useful in a production environment
- ▶ Representation as W3C XML Schemas released
- ▶ Data in XML format released
- ▶ RDF/Linked Data representation work begun

» XML Representation of FRBR/FRAD Data

Data model specification

Entity	Element	Type	Jurisdiction	Offset	Quantity	Normal	Vocabulary	
work	frbr	uniform					naf	
		variant		X			aacr2	
		titleproper						lcsh
		formOfWork						marcformofcomposition aacr2
		dateOfWork	single				yyyy-mm-dd	
			range				yyyy-mm-dd/yyyy-mm-dd	
		mediumOfPerformance				X		aacr2
		numericDesignation	serial opus thematic index					
key						aacr2		
subjectOfWork	topic person place						lcsh	
placeOfOriginOfWork		city county country state				[normalized]	geonet lcsh tgn modshierarchicalgeographic	
	note	sourcedatafound biographicalhistorical [based on field it comes from] critical electronicresource					efrbr	
vFRBR extensions	vfrbr	language				[normalized]	iso639-2b	
		placeOfComposition	city county country state			[normalized]	geonet lcsh tgn modshierarchicalgeographic	

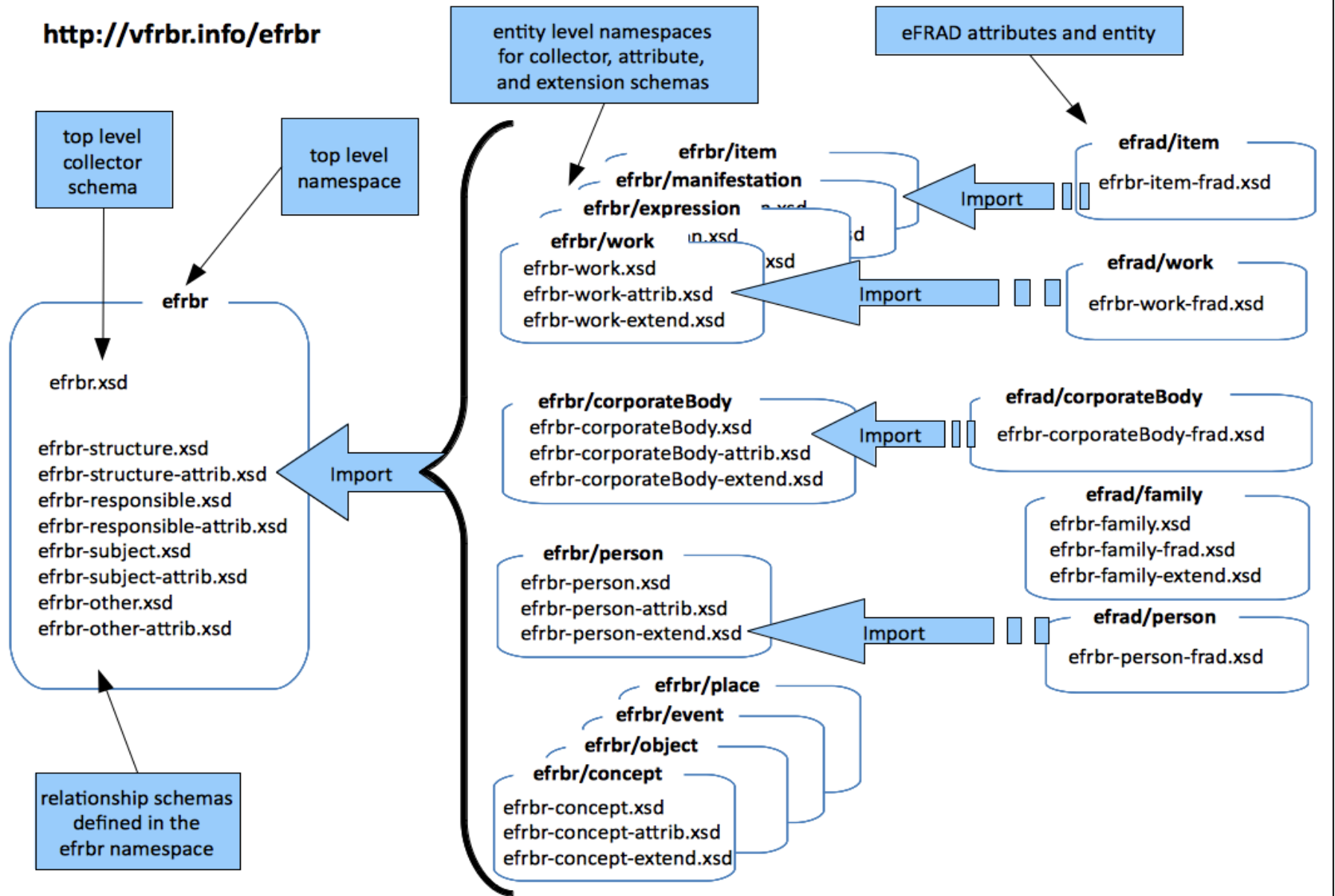
```
<frbr-work:work identifier="http://vfrbr.info/work/1">
  <frbr-work:titleOfWork>
    El Salón México
  </frbr-work:titleOfWork>
  <frbr-work:formOfWork>
    Orchestral music
  </frbr-work:formOfWork>
  <frbr-work:dateOfWork>
    1932 to 1936
  </frbr-work:dateOfWork>
  <frbr-work:mediumOfPerformance>
    Orchestra
  </frbr-work:mediumOfPerformance>
  <frad-work:history>
    First performance date: 1937-08-27
  </frad-work:history>
</frbr-work:work>
```

frbr

```
<efrbr-work:work identifier="http://vfrbr.info/work/1">
  <efrbr-work:titleOfWork type="uniform" offset="3" vocabulary="naf">
    El Salón México
  </efrbr-work:titleOfWork>
  <efrbr-work:formOfWork vocabulary="marcformofcomposition">
    Orchestral music
  </efrbr-work:formOfWork>
  <efrbr-work:dateOfWork type="range" normal="1932/1936">
    1932 to 1936
  </efrbr-work:dateOfWork>
  <efrbr-work:mediumOfPerformance quantity="1" vocabulary="aacr2">
    Orchestra
  </efrbr-work:mediumOfPerformance>
  <efrad-work:history>
    First performance date: 1937-08-27
  </efrad-work:history>
</efrbr-work:work>
```

efrbr

<http://vfrbr.info/efrbr>



»» Data Interoperability Issues

Working towards Linked Data (1)

Entity	Element	Type	Jurisdiction	Offset	Quantity	Normal	Vocabulary
work	titleOfWork	uniform variant titleproper			X		naf aacr2
	formOfWork	<pre> <?xml version="1.0" encoding="UTF-8"?> <rdf:RDF xmlns="http://www.w3.org/1999/02/22-rdf-syntax-ns#" xmlns:base="http://iflastandards.info/ns/fr/frbr/frbrer/" xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#" xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#" xmlns:skos="http://www.w3.org/2004/02/skos/core#" xmlns:dc="http://purl.org/dc/elements/1.1/" xmlns:dct="http://purl.org/dc/terms/" xmlns:owl="http://www.w3.org/2002/07/owl#" xmlns:foaf="http://xmlns.com/foaf/0.1/" xmlns:reg="http://metadataregistry.org/uri/profile/RegAp/"> <!-- Element Set: FRBRer model --> <rdf:Description rdf:about="http://iflastandards.info/ns/fr/frbr/frbrer/"> <dc:title xml:lang="en">FRBRer model</dc:title> <skos:note xml:lang="en">Based on the current text, Feb 2009.</skos:note> <foaf:homepage rdf:resource="http://www.ifla.org/en/publications/functional-requirements-for-bibliographic-records"/> </rdf:Description> <!--Property: has form of work--> <rdf:Description rdf:about="http://iflastandards.info/ns/fr/frbr/frbrer/P3002"> <rdfs:isDefinedBy rdf:resource="http://iflastandards.info/ns/fr/frbr/frbrer/" /> <reg:status rdf:resource="http://metadataregistry.org/uri/RegStatus/1001" /> <reg:name xml:lang="en">hasFormOfWork</reg:name> <rdfs:label xml:lang="en">has form of work</rdfs:label> <skos:definition xml:lang="en">Relates a work to the class to which the work belongs.</skos:definition> <rdf:type rdf:resource="http://www.w3.org/1999/02/22-rdf-syntax-ns#Property" /> <rdfs:domain rdf:resource="http://iflastandards.info/ns/fr/frbr/frbrer/C1001" /> <skos:scopeNote xml:lang="en">E.g., novel, play, poem, essay, biography, symphony, concerto, sonata, map, drawing, pa </rdf:Description> <!-- Status properties used in this document --> <skos:Concept rdf:about="http://metadataregistry.org/uri/RegStatus/1001"> <skos:prefLabel xml:lang="en">Published</skos:prefLabel> </skos:Concept> </rdf:RDF> </pre>					
	dateOfWork						
	mediumOfPerformance						
	numericDesignation						
	key						
	subjectOfWork						
	placeOfOriginOfWork						
note							
vFRBR extensions	language						
	placeOfComposition						

Working towards Linked Data (2)

Entity	Element	Type	Jurisdiction	Offset	Quantity	Normal	Vocabulary
work	titleOfWork	uniform variant titleproper		X			naf aacr2 lcsh marcformofcomposition aacr2
	formOfWork						aacr2
	dateOfWork	single range					
	mediumOfPerformance						aacr2
	numericDesignation	serial opus thematic index					aacr2
	key						lcsh
	subjectOfWork	topic person place					geonet lcsh tgn modshierarchicalgeographic
	placeOfOriginOfWork		city county country state				
	note	sourcedatafound biographicalhistorical [based on field it comes from] critical electronicresource					
vFRBR extensions	language					[normalized]	iso639-2b
	placeOfComposition		city			[normalized]	geonet lcsh tgn modshierarchicalgeographic

RDA registered properties
 Music Ontology
 FRBR in RDF (early model)
 id.loc.gov
 (etc.)

Potentially major complications conforming to formally specified domains and ranges.

Working towards Linked Data (3)

Entity	Element	Type	Jurisdiction	Offset	Quantity	Normal	Vocabulary
work	titleOfWork	uniform		X			naf aacr2 csh marcformofcomposition aacr2
	formOfWork						
	dateOfWork					yyyy-mm-dd yyyy-mm-dd/yyyy-mm-dd	
	mediumOfPerformance				X		aacr2
	numericDesignation	opus thematic index					
	key						aacr2
	subjectOfWork	topic person pl					csh
	placeOfOriginOfWork					[normalized]	geonet csh tgn modshierarchicalgeographic
	note	so bi [b co critical electronicresource					
vFRBR extensions	language					[normalized]	iso639-2b
	placeOfComposition		city county country state			[normalized]	geonet lcsh tgn modshierarchicalgeographic

Need two versions of the data, in different properties?

This could be very easy, or very hard.

Interoperability levels

???

➤ **4: Description Set Profile Interoperability**

- Shared formal vocabularies and constraints in records

➤ **3: Description Set syntactic interoperability**

- Shared formal vocabularies in exchangeable records

➤ **2: Formal semantic interoperability**

- Shared vocabularies based on formal semantics

➤ **1: Shared term definitions**

- Shared vocabularies defined in natural language

RDF/Linked
Data would
reach Level 2

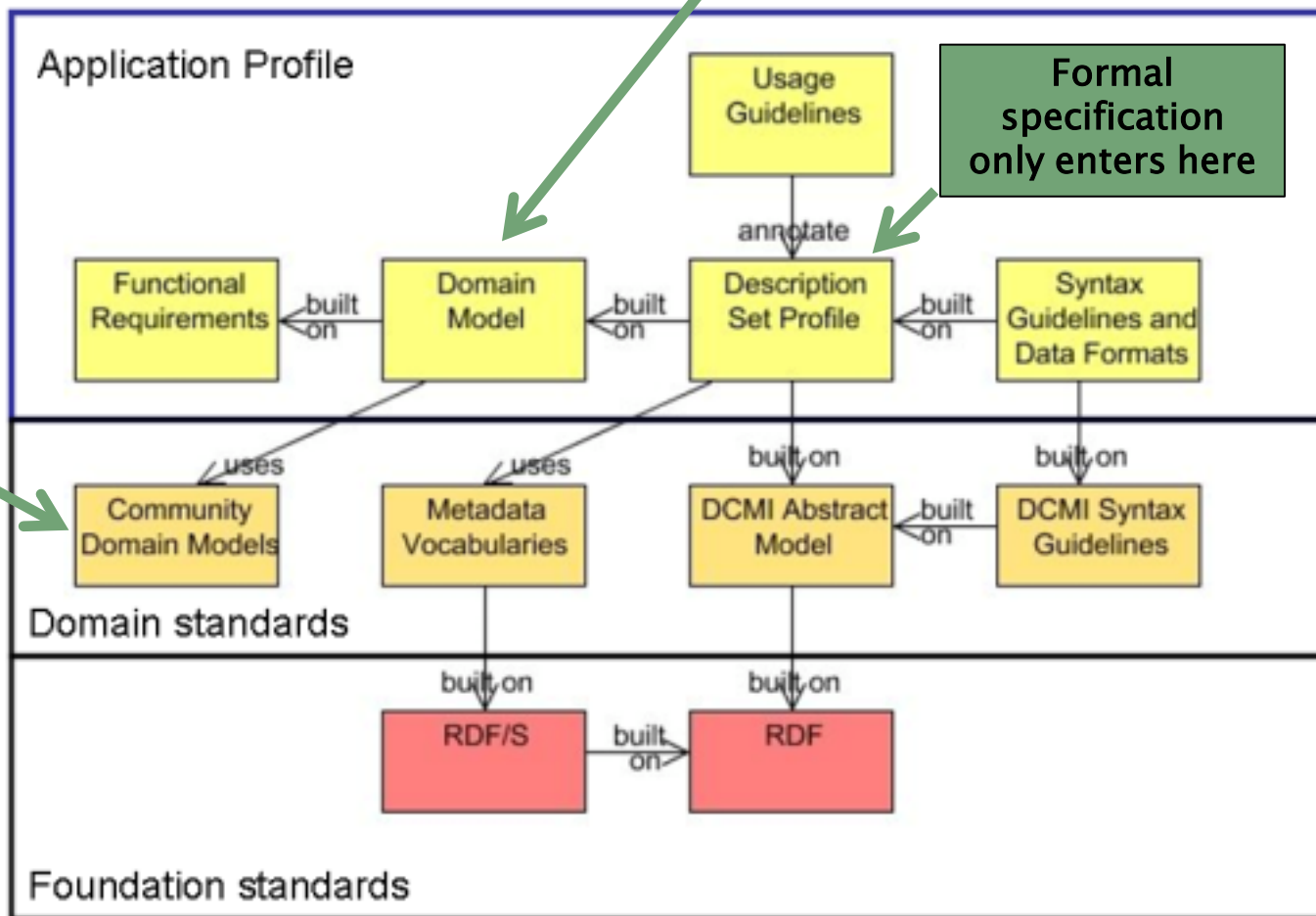
Current XML
representation
at Level 1

<http://dublincore.org/documents/interoperability-levels/index.shtml>

Singapore Framework

SWAP, potentially V/FRBR, and others are here – but share no formal specifications

FRBR is here – but it's in human readable form only



<http://dublincore.org/documents/singapore-framework/index.shtml>

Is there a missing link?

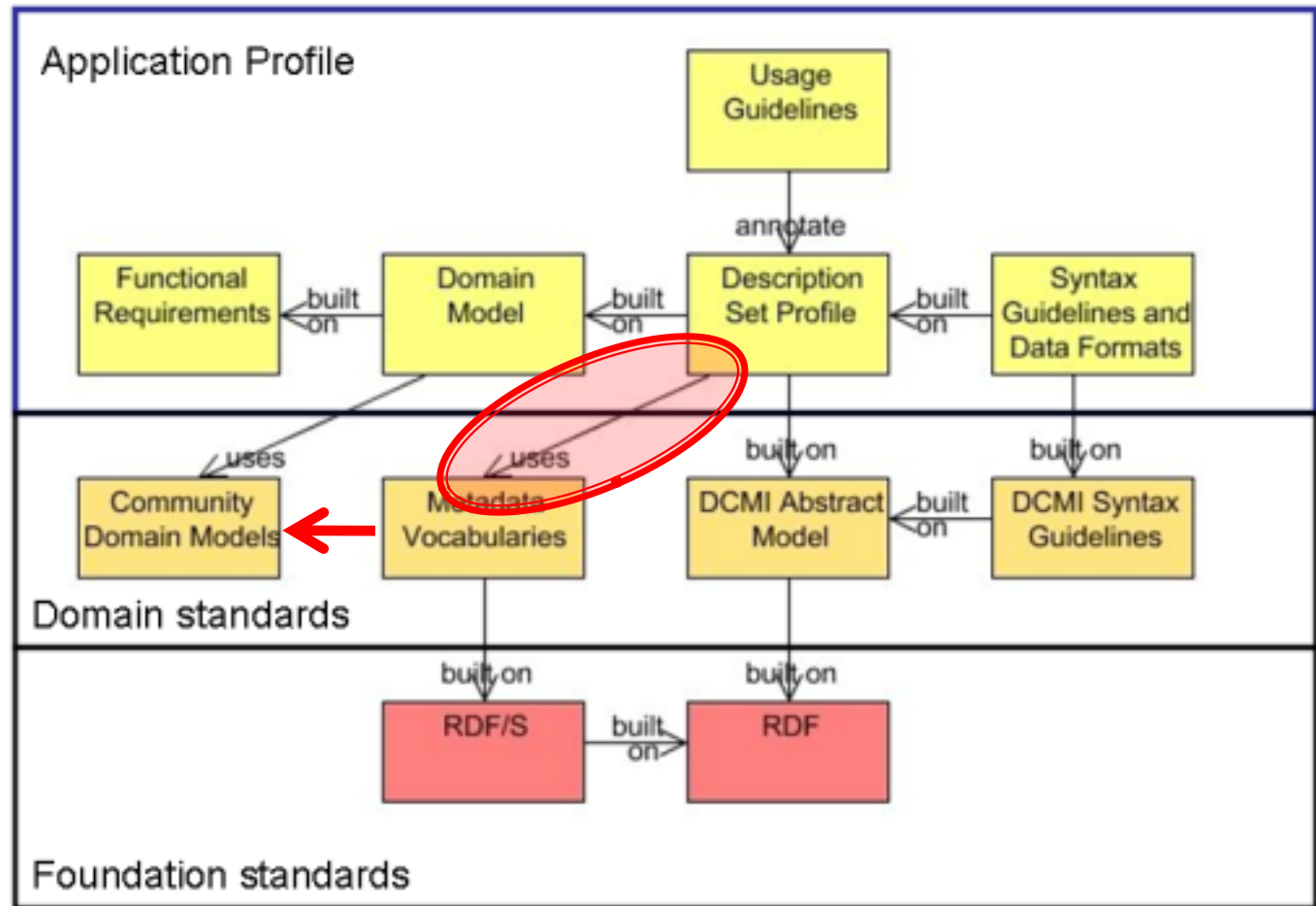
```
<DescriptionSetTemplate xmlns="http://dublincore.org/xml/dc-dsp/2008/01/14"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://dublincore.org/xml/dc-dsp/2008/01/14
  http://dublincore.org/architecturewiki/DescriptionSetProfile?action=AttachFile&do=get&target=dcmi-dsp.xsd ">
  <DescriptionTemplate ID="ScholarlyWork" maxOccurs="1" minOccurs="1" standalone="yes">
    <ResourceClass>http://purl.org/eprint/entityType/ScholarlyWork</ResourceClass>
    <StatementTemplate minOccurs="1" maxOccurs="1" type="nonliteral">
      <Property>http://purl.org/dc/elements/1.1/type</Property>
      <NonLiteralConstraint>
        <ValueURIOccurrence>mandatory</ValueURIOccurrence>
        <ValueURI>http://purl.org/eprint/entityType/ScholarlyWork</ValueURI>
        <VocabularyEncodingSchemeOccurrence>mandatory</VocabularyEncodingSchemeOccurrence>
        <VocabularyEncodingSchemeURI>http://purl.org/eprint/entityType</VocabularyEncodingSchemeURI>
        <ValueStringConstraint maxOccurs="0"/>
      </NonLiteralConstraint>
    </StatementTemplate>
    <StatementTemplate minOccurs="1" type="literal">
      <Property>http://purl.org/dc/elements/1.1/title</Property>
    </StatementTemplate>
    <StatementTemplate type="nonliteral">
      <Property>http://purl.org/dc/elements/1.1/subject</Property>
      <NonLiteralConstraint>
        <ValueURIOccurrence>optional</ValueURIOccurrence>
        <VocabularyEncodingSchemeOccurrence>optional</VocabularyEncodingSchemeOccurrence>
        <ValueStringConstraint maxOccurs="1">
          <LanguageOccurrence>optional</LanguageOccurrence>
          <SyntaxEncodingSchemeOccurrence>disallowed</SyntaxEncodingSchemeOccurrence>
        </ValueStringConstraint>
      </NonLiteralConstraint>
    </StatementTemplate>
  </DescriptionTemplate>
</DescriptionSetTemplate>
```

This isn't formally defined in RDF anywhere; and isn't explicitly required to be by the DCAP guidelines.

Any changes needed here?

Stronger?

Necessary?



Better FRBR interoperability

- ▶ Newly-minted official FRBR classes/properties provide a good starting point.
 - ▶ Shared/core FRBR DSP?
 - ▶ How can we bring RDA work in more tightly?
 - ▶ What should the V/FRBR project do next?
-
- ▶ Any lessons here for the DCAM/DSP revision?

Thank you!

- ▶ For more information:
 - <http://vfrbr.info>
 - XML Schemas: <http://vfrbr.info/schemas>
 - XML data download: <http://vfrbr.info/data/1.0>
 - Linked Data: hopefully on the way!
 - jenlrile@indiana.edu
 - These presentation slides:
 - <http://www.dlib.indiana.edu/~jenlrile/presentations/dc2010/riley.pptx>

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