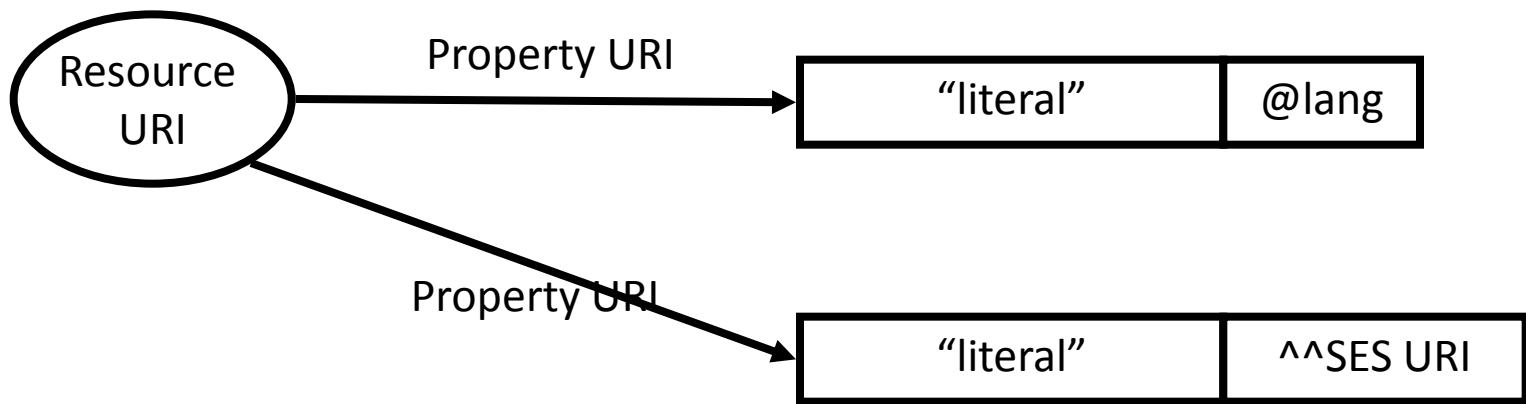
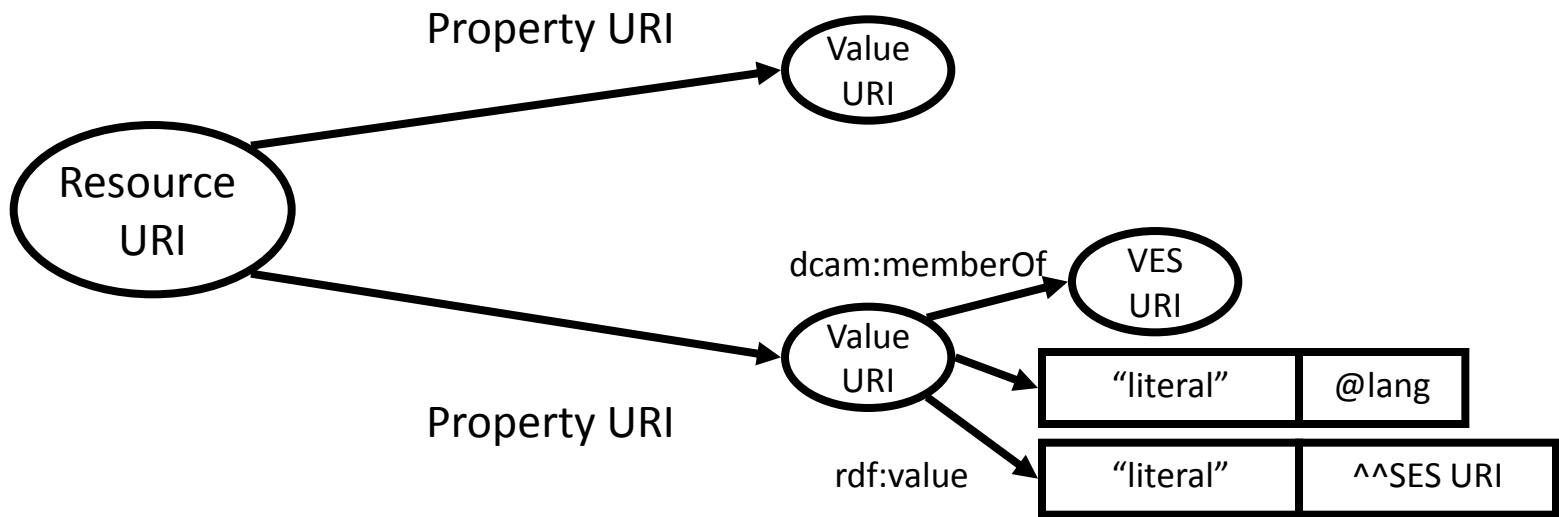
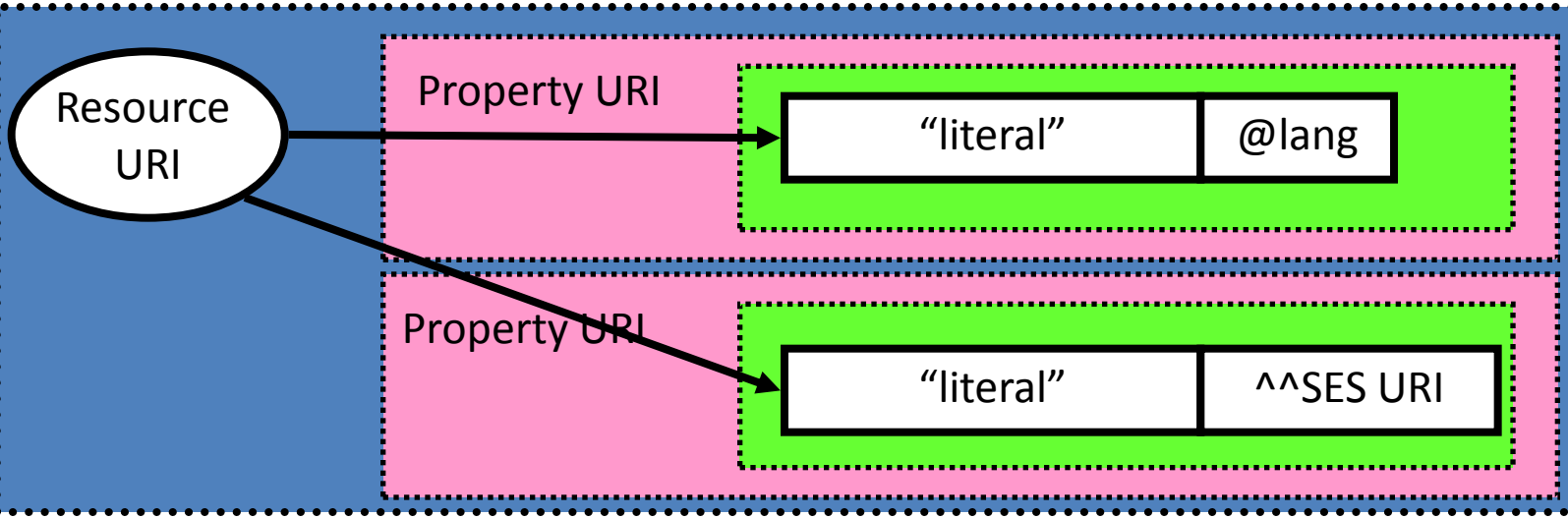
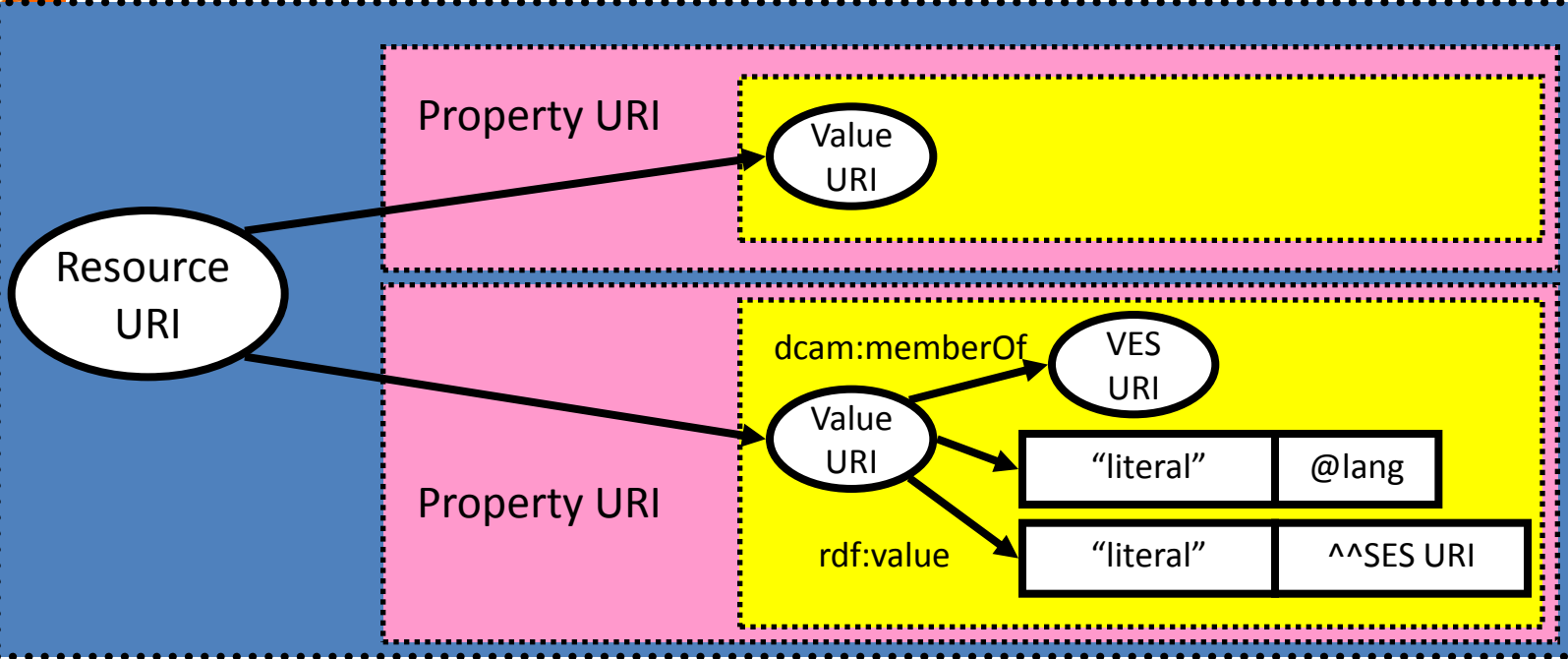
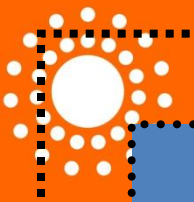




THE “METADATA RECORD” AND DCMI ABSTRACT MODEL







DCAM Description Set Model

- The structure of “DC metadata”
- Uses URIs to refer to resources described & to metadata terms
- a *description set* is made up of one or more *descriptions*, each of which describes one *resource*
- a *description* is made up of
 - zero or one *described resource URI*
 - **identifies** *described resource*
 - one or more *statements*
- a *statement* is made up of
 - exactly one *property URI*
 - **identifies** *property*
 - exactly one *value surrogate*
- a *value surrogate* is either a *literal value surrogate* or a *non-literal value surrogate*

e.g. <http://dublincore.org/documents/2007/06/04/abstract-model/>

e.g. <http://purl.org/dc/terms/subject>



Description

Resource URI

Statement

Property URI

Non-Literal Value Surrogate

Statement

Property URI

Non-Literal Value Surrogate

Description

Resource URI

Statement

Property URI

Literal Value Surrogate

Statement

Property URI

Literal Value Surrogate



DCAM Description Set Model

- a *literal value surrogate* is made up of
 - exactly one *value string*
 - **encodes** value
- a *non-literal value surrogate* is made up of
 - zero or one *value URIs*
 - **identifies** value
 - zero or one *vocabulary encoding scheme URI*
 - **identifies** a set of which the *value* is a member
 - zero or more *value strings*
 - **represents** value
- a *value string* is either a *plain value string* or a *typed value string*
 - a *plain value string* may have an associated *value string language*
 - a *typed value string* is associated with a *syntax encoding scheme URI*
- Vocabulary Encoding Scheme
 - A named set to which a “Thing” belongs
- Syntax Encoding Scheme
 - A named set of rules for the “interpretation” of a set of “Strings”

e.g. “DCMI Abstract Model”

e.g. <http://www.w3.org/TR/2004/REC-rdf-concepts-20040210/>

e.g. <http://purl.org/dc/terms/LCSH>

e.g. “metadata”

e.g. “métadonnées”

Description

Resource URI

Statement

Property URI

Non-Literal Value Surrogate

Value URI

Statement

Property URI

Non-Literal Value Surrogate

Value URI

Vocab Enc Scheme URI

Value string

Language

Value string

Syntax Enc Scheme URI

Description

Resource URI

Statement

Property URI

Literal Value Surrogate

Value string

Language

Statement

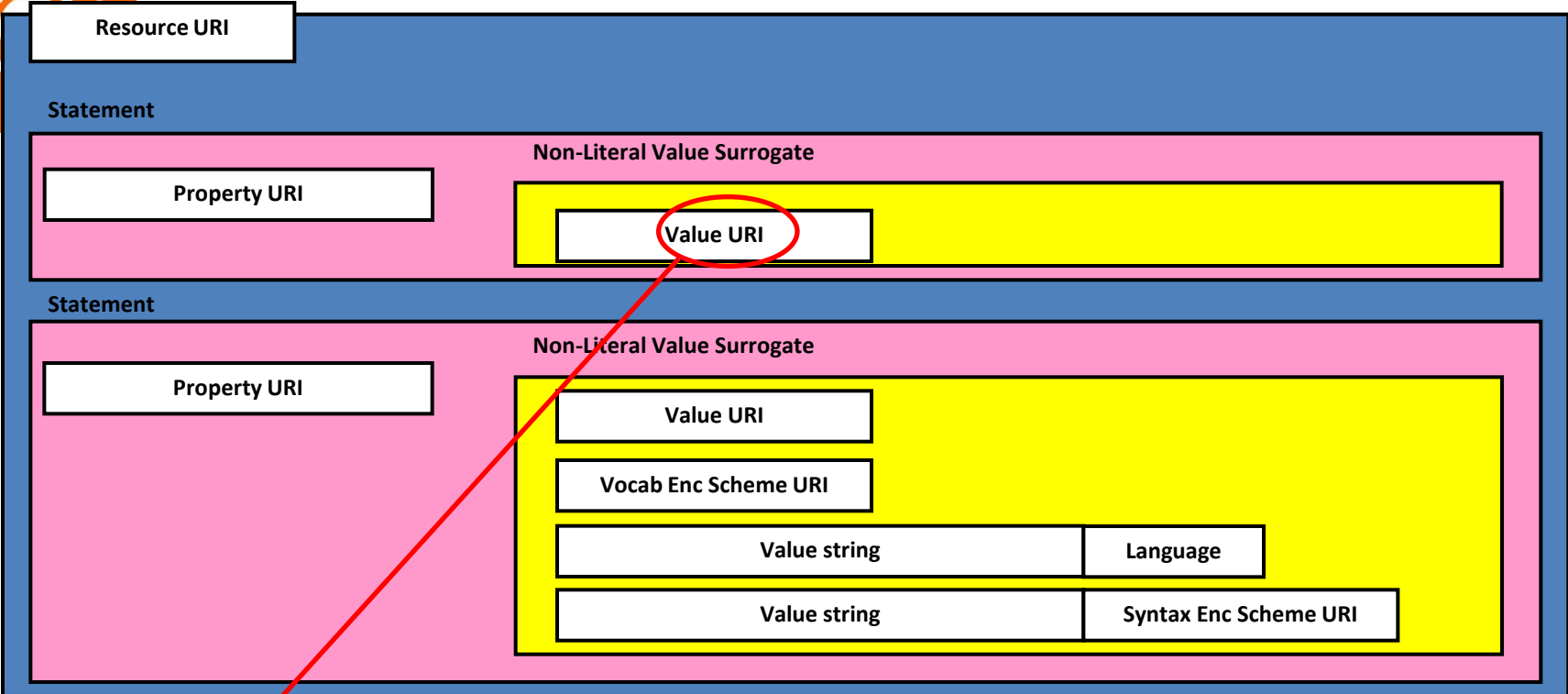
Property URI

Literal Value Surrogate

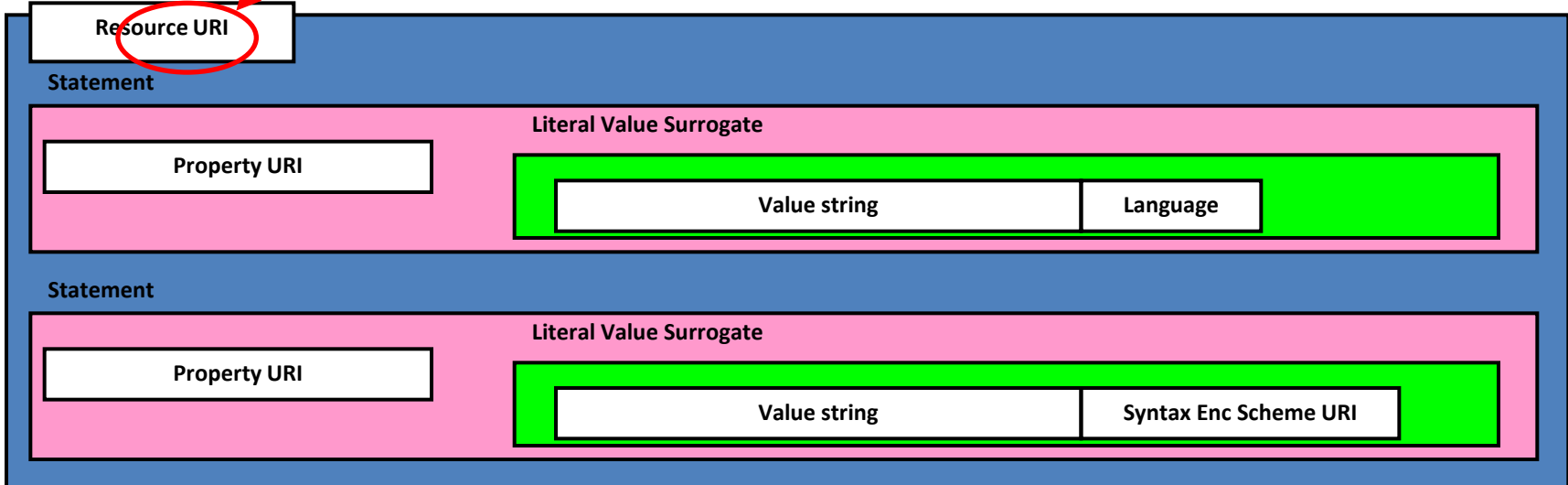
Value string

Syntax Enc Scheme URI

Description



Description



Example: Description of document, description of publisher

Description Set

Description

`<http://dublincore.org/documents/2007/06/04/abstract-model/>`

Statement

Non-Literal Value Surrogate

`<http://purl.org/dc/terms/publisher>`

`<http://example.org/org/DCMI>`

Value URI

Statement

Non-Literal Value Surrogate

`<http://purl.org/dc/terms/subject>`

`<http://example.org/mySH/h123>`

Value URI

`<http://example.org/terms/mySH>`

Vocab Enc
Scheme URI

"Metadata"

en

Value String

"Métadonnées"

fr

Value String

Description

`<http://example.org/org/DCMI>`

Statement

Literal Value Surrogate

`<http://xmlns.com/foaf/0.1/name>`

"Dublin Core Metadata Initiative"

en

Value String

Statement

Literal Value Surrogate

`<http://purl.org/dc/terms/created>`

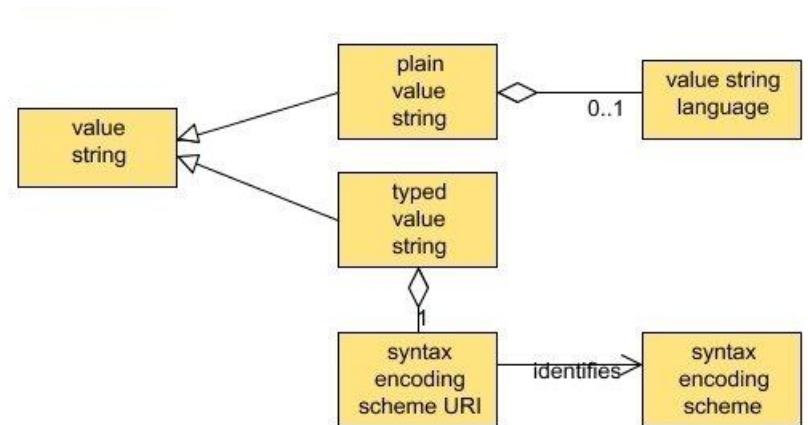
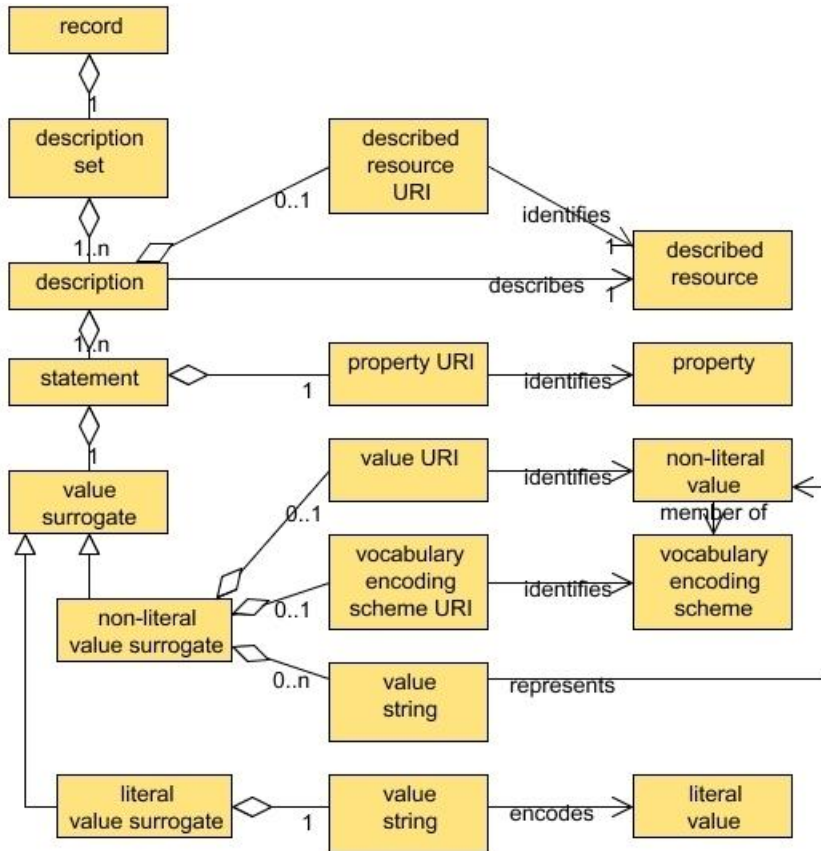
"1995"

^^xsd:year

Value String



DCAM Description Set Model






ENCODING GUIDELINES BASED ON DCMI ABSTRACT MODEL



DC-RDF

- Any concrete syntax for RDF can be used for Dublin Core metadata
 - Available syntaxes include RDF/XML, N3, Turtle, RDFa
- “Expressing DC metadata using RDF” (2008)
 - <http://dublincore.org/documents/2008/01/14/dc-rdf/>
 - Uses RDF abstract syntax
 - Supports full DCAM description model



```
<?xml version="1.0" encoding="UTF-8" ?>
```

```
<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
```

```
  xmlns:dcterms="http://purl.org/dc/terms/"
```

```
  xmlns:dcam="http://purl.org/dc/dcam/"
```

```
  xmlns:foaf="http://xmlns.com/foaf/0.1/" >
```

```
<rdf:Description
```

```
  rdf:about="http://dublincore.org/documents/2007/06/04/abstract-model/">
```

```
<dcterms:publisher rdf:resource="http://example.org/org/DCMI" />
```

```
<dcterms:subject>
```

```
<rdf:Description rdf:about="http://example.org/mySH/h123" >
```

```
<dcam:memberOf rdf:resource="http://example.org/terms/mySH" />
```

```
<rdf:value xml:lang="en">Metadata</rdf:value>
```

```
<rdf:value xml:lang="fr">Métadonnées</rdf:value>
```

```
</rdf:Description>
```

```
</dcterms:subject>
```

```
</rdf:Description>
```

```
<rdf:Description rdf:about="http://example.org/org/DCMI">
```

```
<foaf:name xml:lang="en">Dublin Core Metadata Initiative</foaf:name>
```

```
<dcterms:created
```

```
  rdf:datatype="http://www.w3.org/2001/XMLSchema#year">1995</dcterms:created >
```

```
</rdf:Description>
```

```
</rdf:RDF>
```



DC-Text

- “Expressing DC metadata using DC-Text”,
DCMI Recommended Resource, 2007-12-03
 - <http://dublincore.org/documents/2007/12/03/dc-text/>
 - Supports full DCAM description model
 - Intended for human-readability rather than machine-processing



@prefix page: <<http://dublincore.org/pages/>> .
@prefix dcterms: <<http://purl.org/dc/terms/>> .
@prefix exterms: <<http://example.org/terms/>> .
@prefix exsh: <<http://example.org/sh/>> .

```
DescriptionSet (  
  Description (  
    ResourceURI ( page:home )  
    Statement (  
      PropertyURI ( dcterms:subject )  
      ValueURI ( exsh:metadata )  
      VocabularyEncodingSchemeURI ( exterms:EXSH )  
      ValueString ( "Metadata"  
        Language ( en )  
      )  
      ValueString ( "Métadonnées"  
        Language ( fr )  
      )  
    )  
  )  
)  
)  
)
```



DC-HTML

- RDFa is an excellent option for embedding Dublin Core descriptions in HTML documents
- “Expressing DC metadata using HTML/XHTML meta and link elements”
 - <http://dublincore.org/documents/2008/08/04/dc-html/>
 - Supports subset of DCAM description model
 - DC metadata in HTML document describes that document
 - or at least document of which HTML page is representation
 - An HTML meta-data profile
 - GRDDL Profile Transformation to generate RDF/XML


```
<?xml version="1.0" encoding="UTF-8" ?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
  "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
  <head profile="http://dublincore.org/documents/2008/08/04/dc-html/">
    <title>DCMI Abstract Model</title>
    <base href="http://dublincore.org/documents/2007/06/04/abstract-model/" />
    <link rel="schema.DCTERMS" href="http://purl.org/dc/terms/" />
    <link rel="DCTERMS.subject" href="http://example.org/terms/mySH/h123"
      xml:lang="en" title="Metadata" />
    <link rel="DCTERMS.publisher" href="http://example.org/org/DCMI" />
  </head>
  <body>
  </body>
</html>
```



Dublin Core metadata in XML

- “Expressing DC Description Sets using XML (DC-DS-XML)”
 - <http://dublincore.org/documents/2008/09/01/dc-ds-xml/>
 - Supports full DCAM description model
 - Verbose, but easily processable
 - GRDDL Namespace Transformation to generate RDF/XML

<?xml version="1.0" encoding="UTF-8" ?>

<dcds:descriptionSet xmlns:dcds="http://purl.org/dc/xmlns/2008/09/01/dc-ds-xml/">

<dcds:description

 dcds:resourceURI="http://dublincore.org/pages/home">

 <dcds:statement

 dcds:propertyURI="http://purl.org/dc/terms/publisher"

 dcds:valueURI="http://example.org/org/DCMI" />

 <dcds:statement

 dcds:propertyURI="http://purl.org/dc/terms/subject"

 dcds:valueURI="http://example.org/terms/mySH"

 dcds:valueURI="http://example.org/mySH/h123">

 <dcds:valueString xml:lang="en">Metadata</dcds:valueString>

 <dcds:valueString xml:lang="fr">Métadonnées</dcds:valueString>

 </dcds:statement>

</dcds:description>

<dcds:description

 dcds:resourceURI="http://example.org/org/DCMI">

 <dcds:statement dcds:propertyURI="http://xmlns.com/foaf/0.1/name">

 <dcds:literalValueString xml:lang="en">Dublin Core Metadata Initiative</dcds:literalValueString>

 </dcds:statement>

 <dcds:statement dcds:propertyURI="http://purl.org/dc/terms/created">

 <dcds:literalValueString

 dcds:valueURI="http://www.w3.org/2001/XMLSchema#year">1995</dcds:literalValueString>

 </dcds:statement>

</dcds:description>

</dcds:descriptionSet>



Metadata Records and RDF

- Dublin Core terms can be used in RDF without using DC-AM
- In using the DC-AM, you are also using RDF
 - DC-AM adds the notion of a bounded “record” (description set)
- Other RDF-based “record” formats under development using SPARQL Named Graphs



SINGAPORE FRAMEWORK



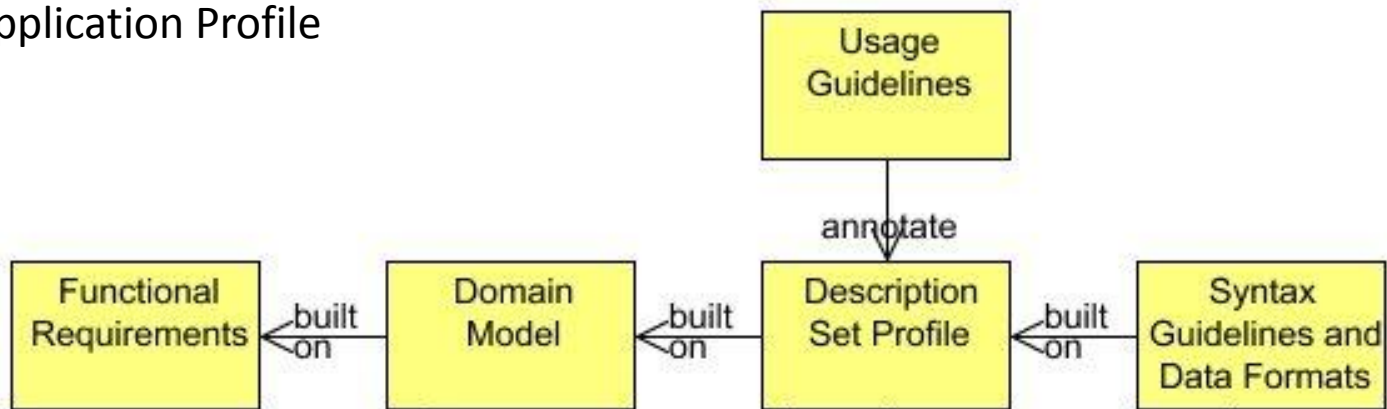
Dublin Core Application Profile

- Specification of how to construct description sets (descriptions, statements) to serve some purpose
- At core, a profile of a “description set”
 - a set of constraints on the description set
 - based on E-R model of problem space
- Enables
 - structural validation
 - predictability for processing, querying etc

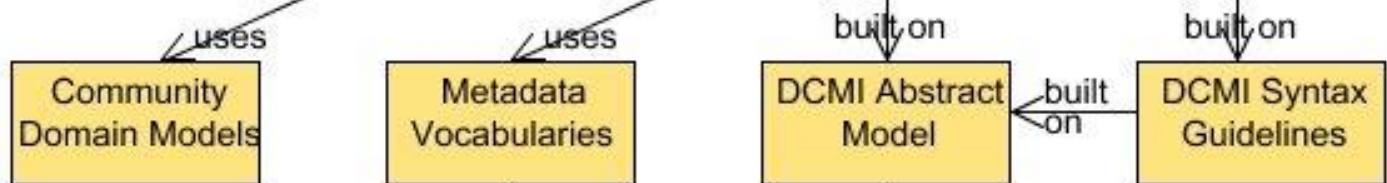


Singapore Framework

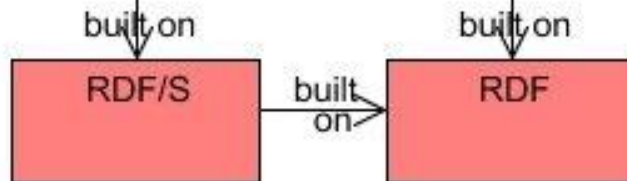
Application Profile

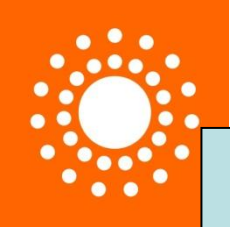


Domain standards

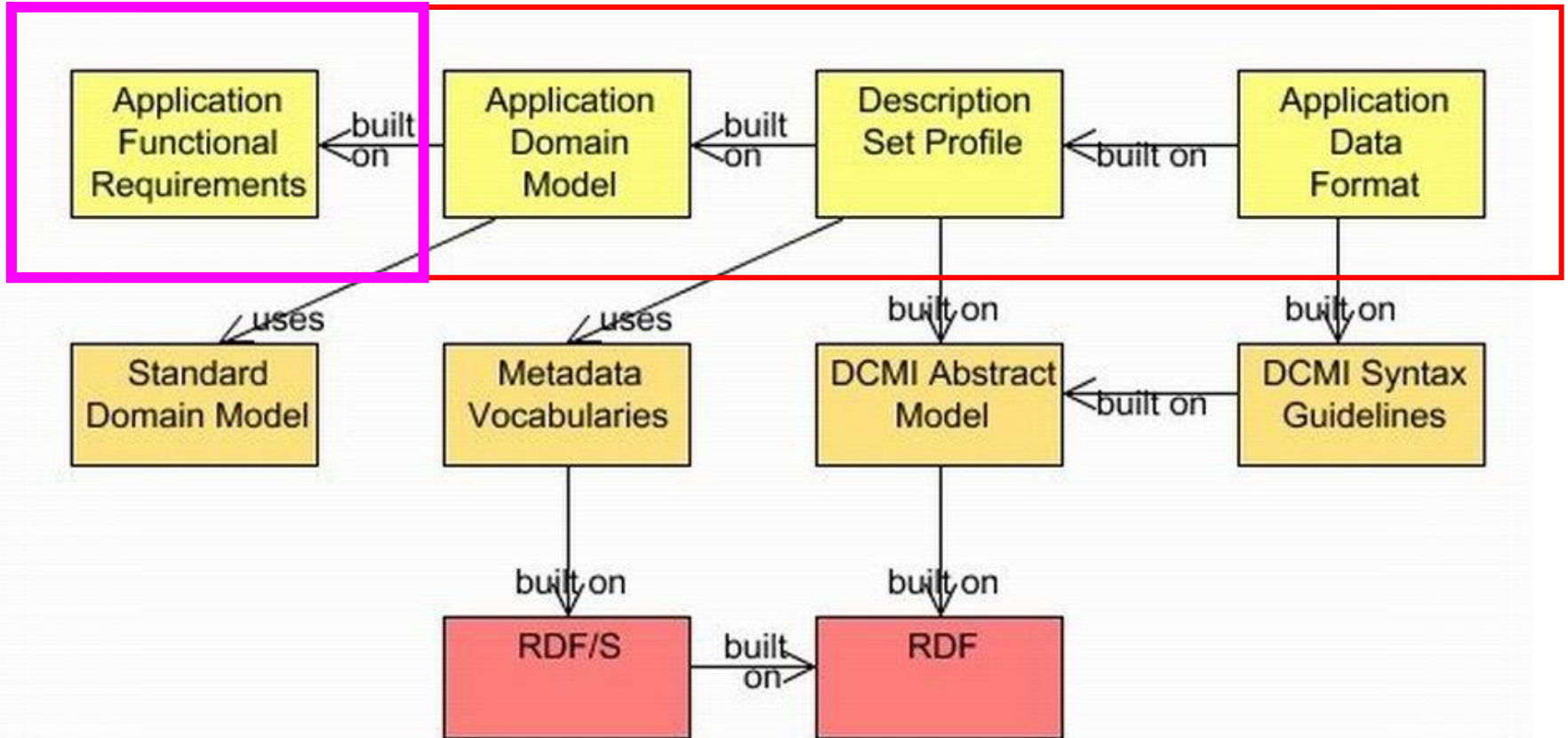


Foundation standards



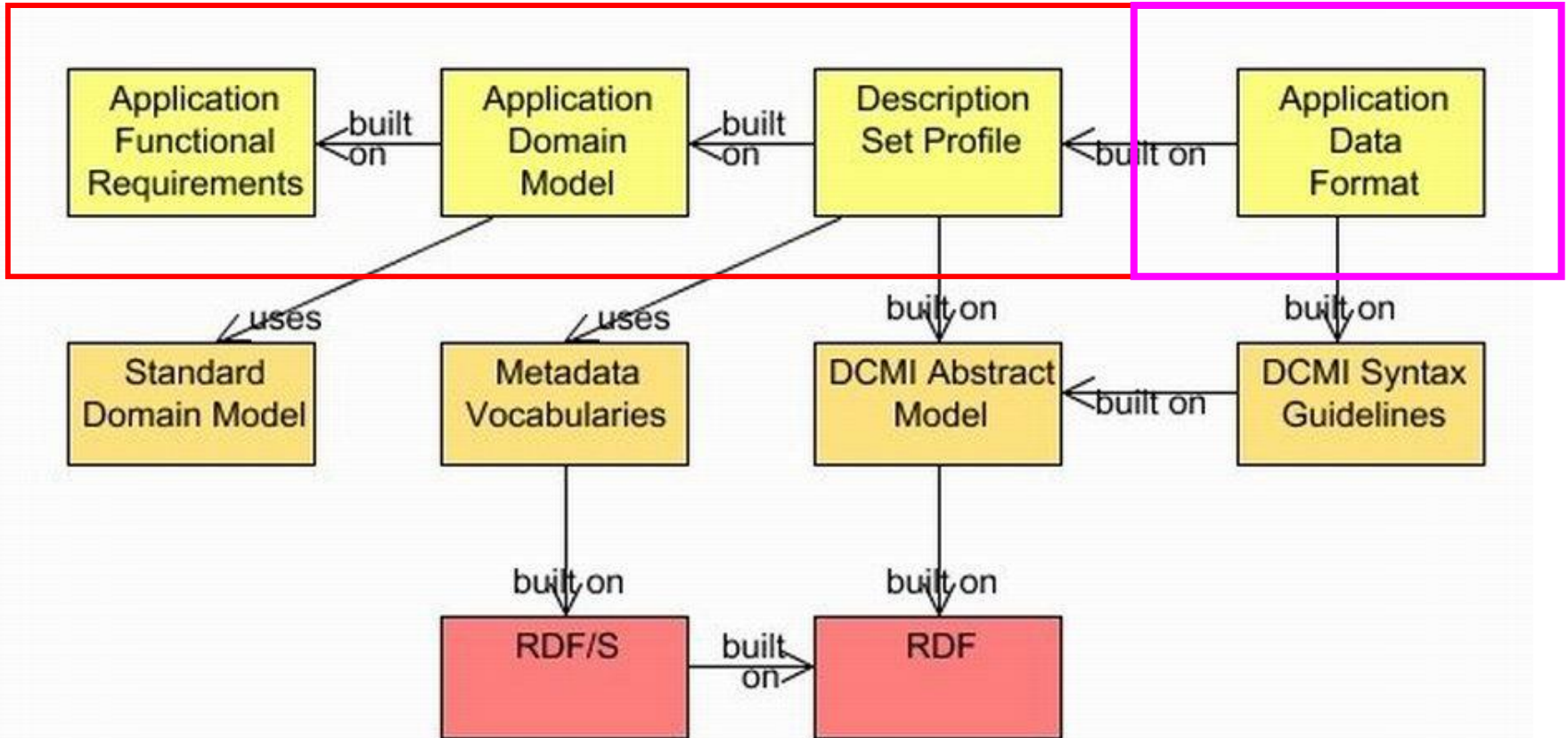
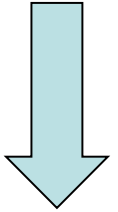


Getting from Requirements...



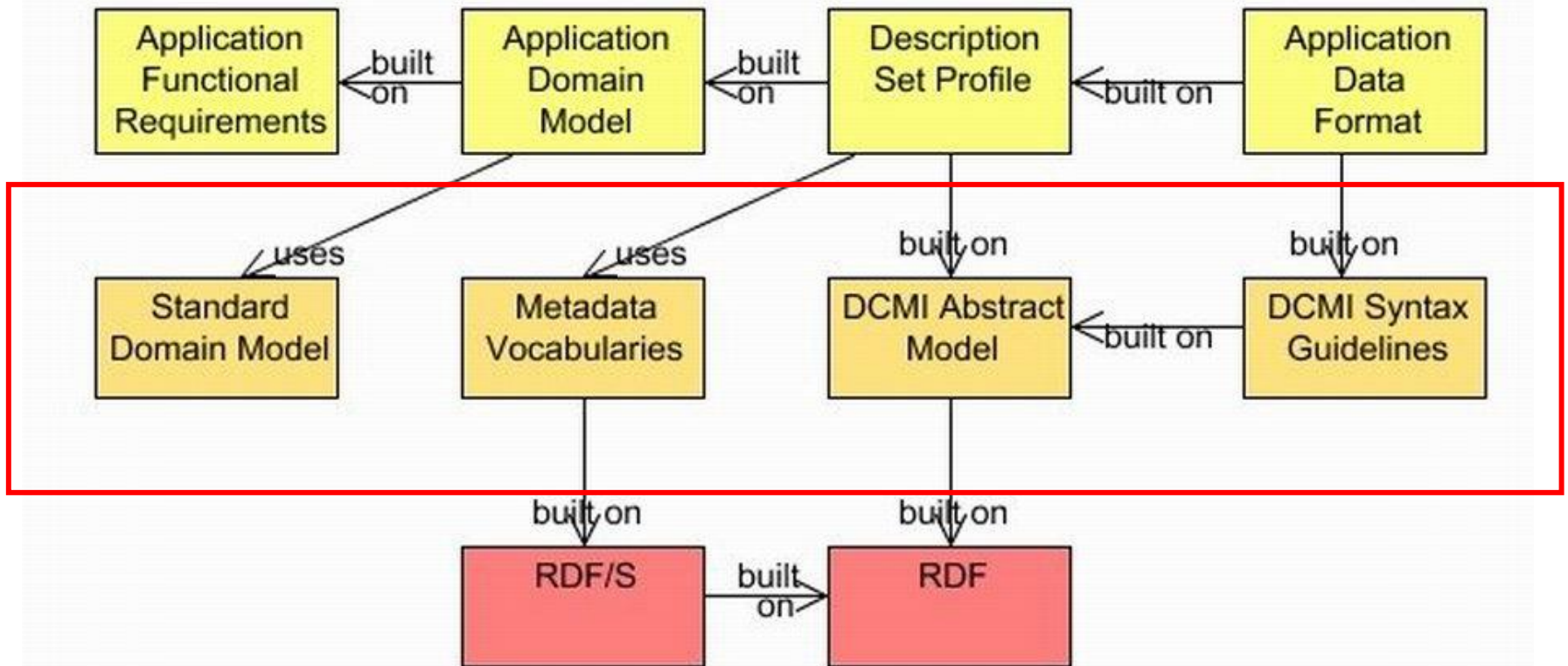


...to a Data Format



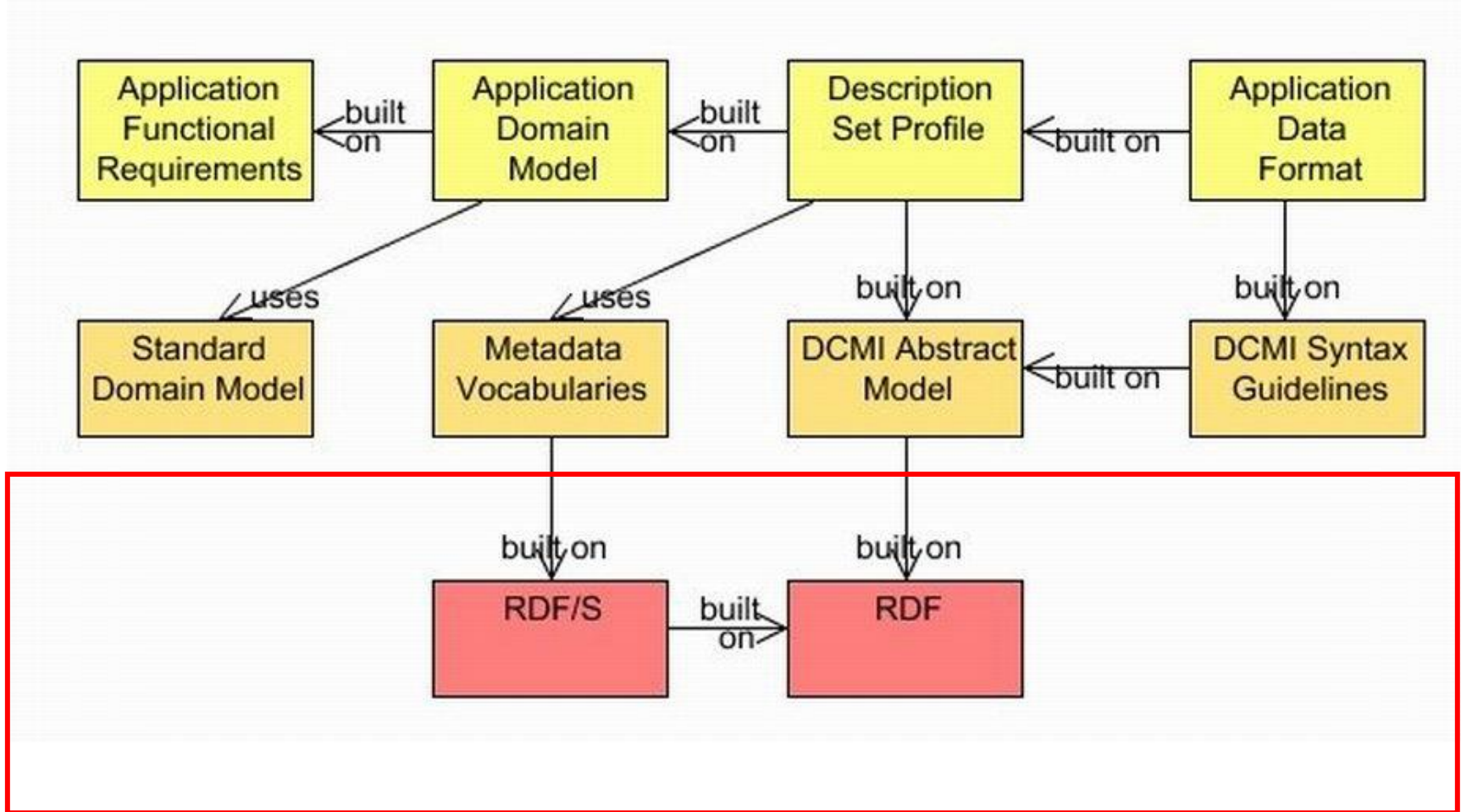


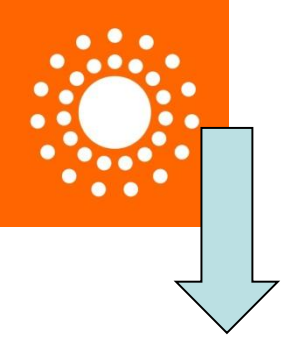
...based on Community Standards



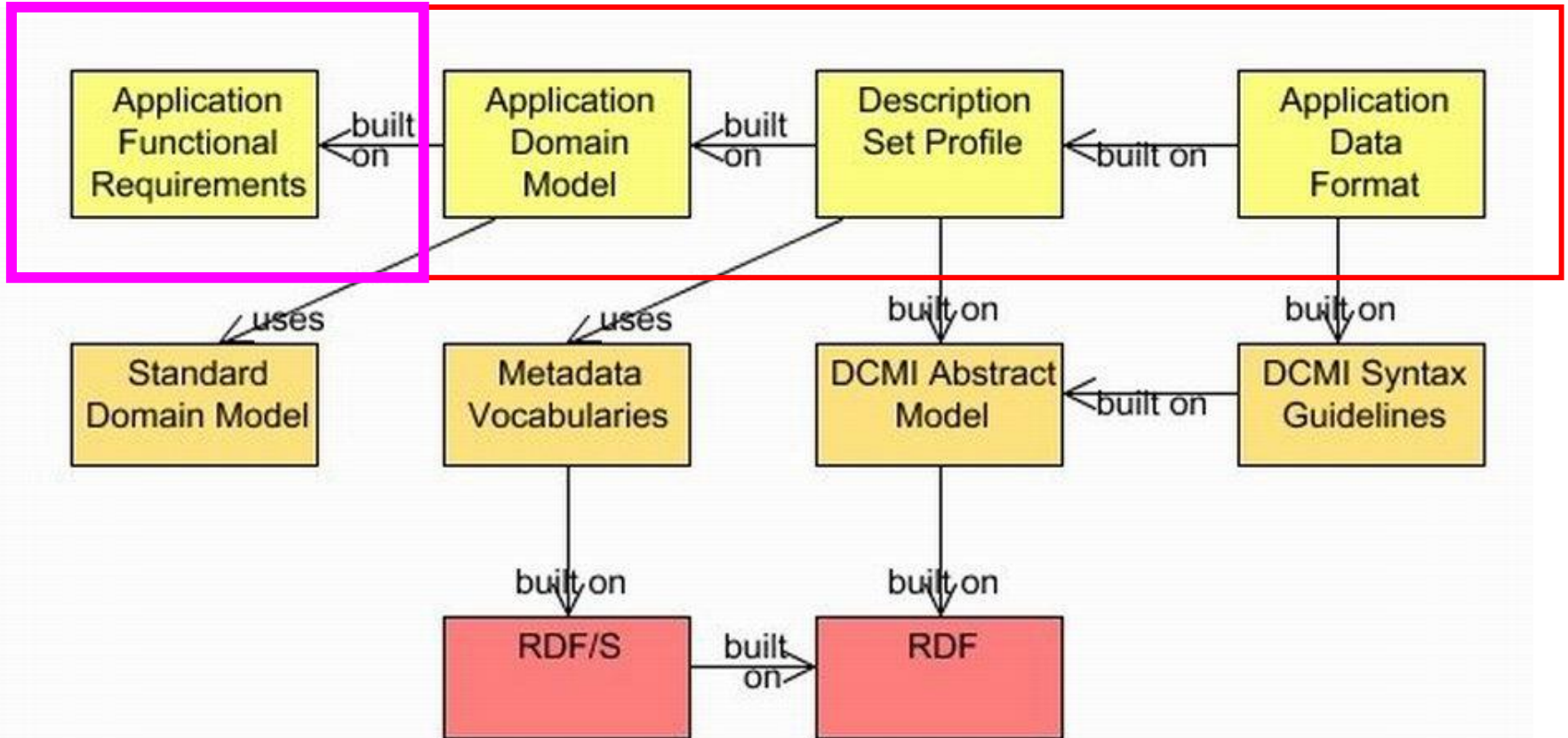


...on the basis of Foundation Standards (RDF)





What does your application need to do?



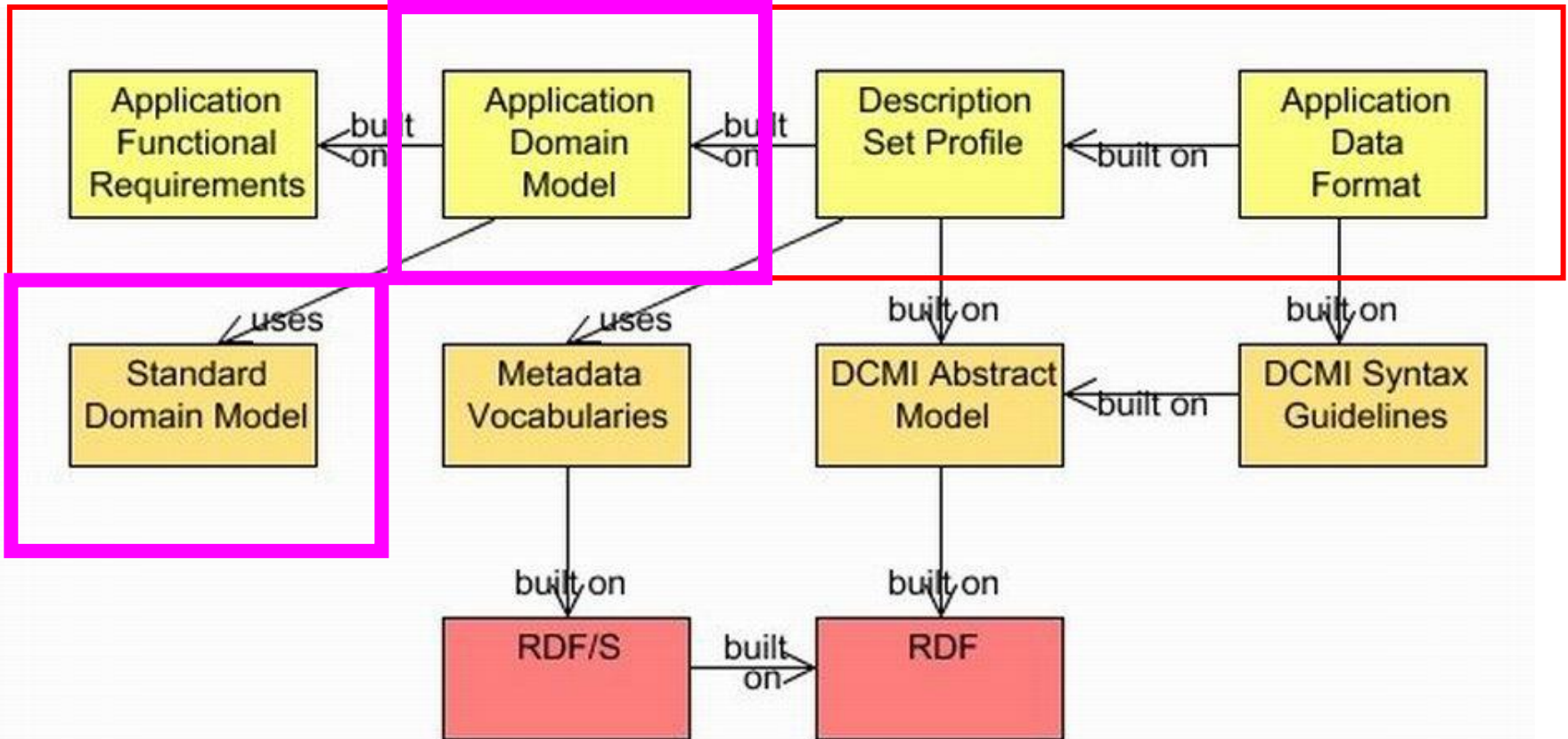


Functional Requirements

- What activities must the application support?
 - Who are the users? How expert are they?
- Scholarly Works Application Profile examples:
 - “Facilitate identification of open access materials.”
 - “Be compatible with preservation metadata approaches.”
 - “Enable identification of research funder and project code.”
 - “Support navigation between different 'versions' of the same eprint.”
- DC Collections Application Profile examples:
 - “Enable searching on the entity that owns the collection”
 - “Enable selection of a collection based on a textual description”



What things are being described?





The simplest domain model...!

Resource



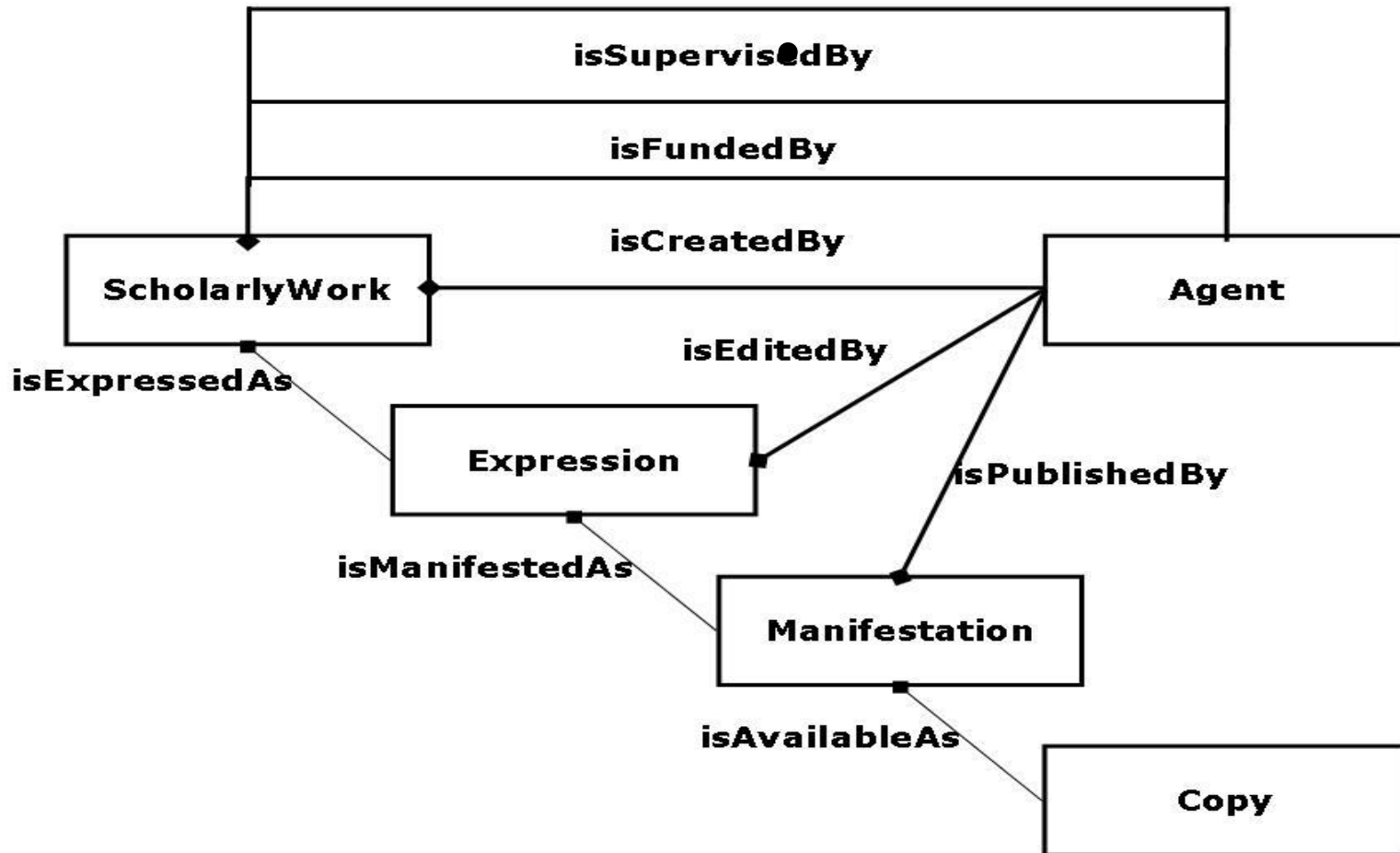
A slightly more complicated domain model





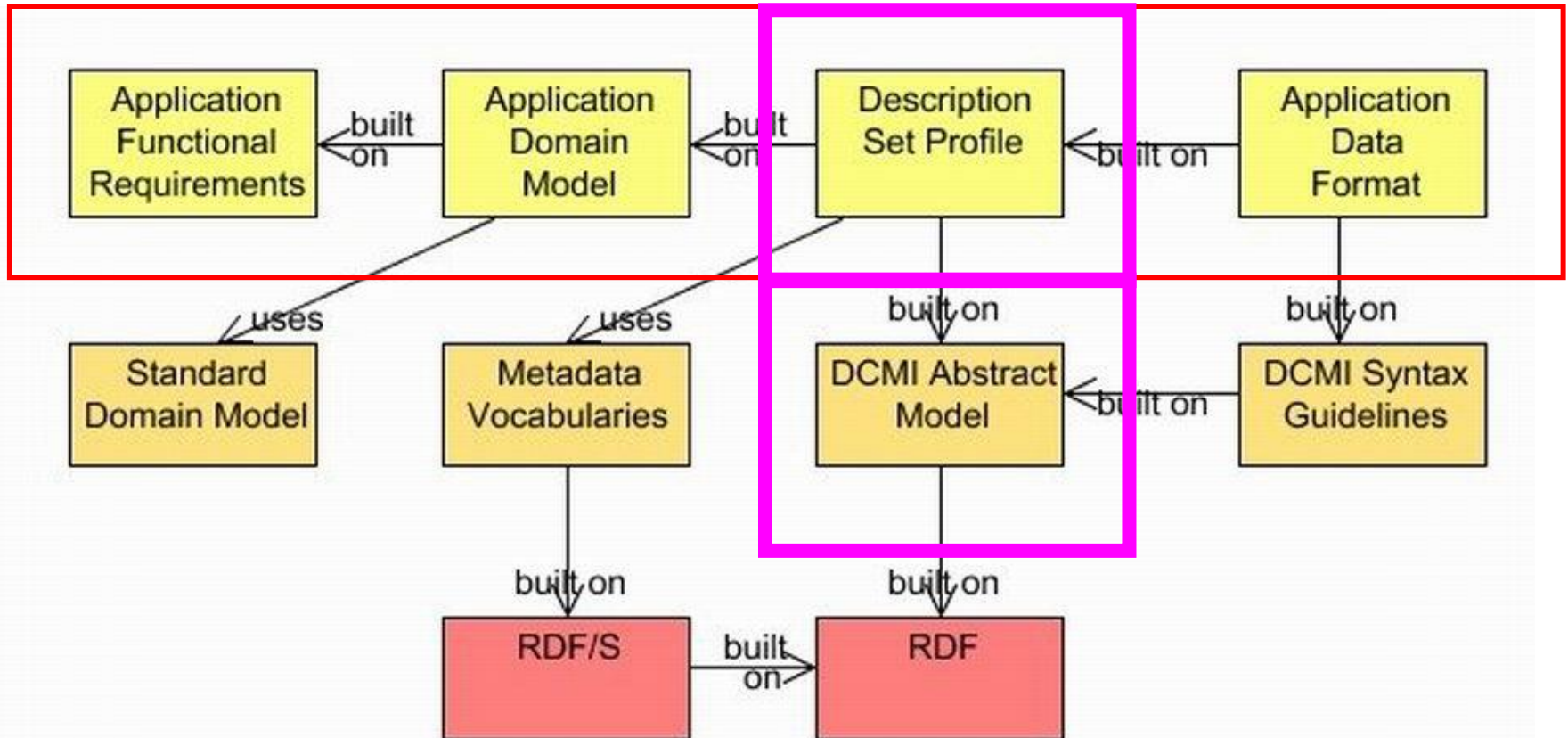
Domain Model for Scholarly Works Application Profile

AffiliatedInstitution





Description Set Profile, based on DCMI Abstract Model





DCMI Description Set Profile (DSP)

- A way of describing **structural constraints** on a description set
 - the resources that may be described by descriptions in the description set
 - the properties that may be referenced in statements
 - the ways a value surrogate may be given
- Description templates, statement templates
- Model & XML Syntax for DSP
 - Working draft by Mikael Nilsson (Royal Institute of Technology, Sweden)
 - <http://dublincore.org/documents/2008/03/31/dc-dsp/>



Description Set Profile

Description

`<http://dublincore.org/documents/2007/06/04/abstract-model/>`

Statement

Property URI

`<http://purl.org/dc/terms/publisher>`

Non-Literal Value Surrogate

`<http://example.org/org/DCMI>`

Value URI

Statement

Property URI

`<http://purl.org/dc/terms/subject>`

Non-Literal Value Surrogate

`<http://example.org/mySH/h123>`

Value URI

`<http://example.org/terms/mySH>`

Vocab Enc Scheme URI

"Metadata"	en
------------	----

Value String

"Métadonnées"	fr
---------------	----

Value String

Description

`<http://example.org/org/DCMI>`

Statement

Property URI

`<http://xmlns.com/foaf/0.1/name>`

Literal Value Surrogate

"Dublin Core Metadata Initiative"	en
-----------------------------------	----

Value String

Statement

Property URI

`<http://purl.org/dc/terms/created>`

Literal Value Surrogate

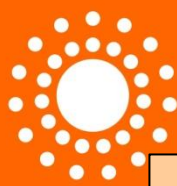
"1995"	^^xsd:year
--------	------------

Value String



Example: Description Set Profile of a Book

- A book:
 - a literal title
 - a creator, described separately
- A creator
 - a literal name



Templates and constraints

Description Template: Book

Statement template: literal title

Property: [dcterms:title](#)

Literal value Language SES

Statement template: creator

Property: [dcterms:creator](#)

Description reference: [Creator](#)

Value URI

Vocabulary Encoding Scheme

Value string Language SES

Description Template: Creator

Statement template: literal name

Property: [foaf:name](#)

[standalone:no](#)

Literal value Language SES



Documentation of templates and constraints

Description of the eprint as a ScholarlyWork

Entity type

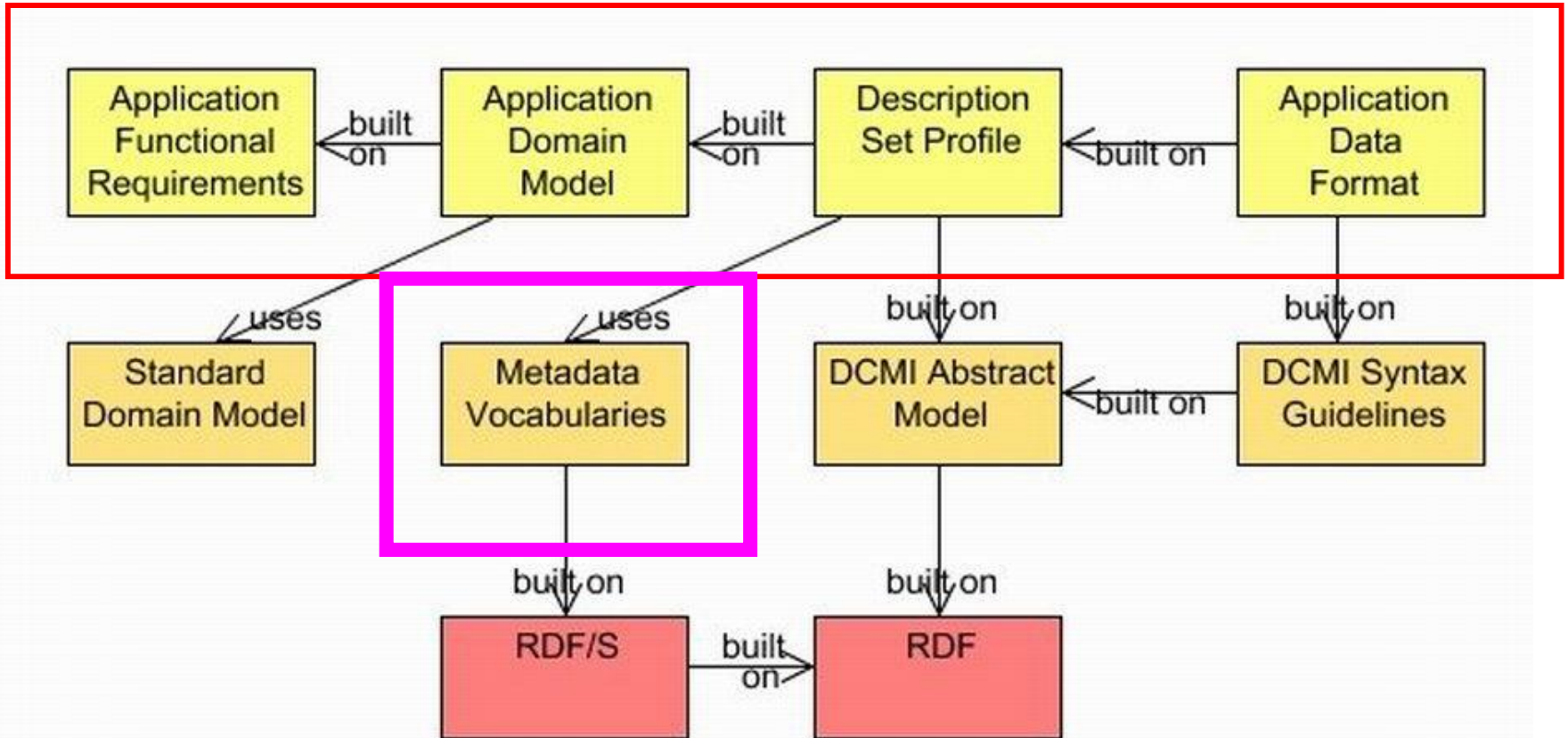
Property	http://purl.org/dc/elements/1.1/type																
Min occurrence	1																
Max occurrence	1																
Literal?	No																
Definition	The type nature or genre of the content of the resource.																
Eprint-specific recommendation	Each of the entity <i>descriptions</i> in the <i>description sets</i> conforming with this application profile will need to be explicitly typed. This is done using a <i>dc:type statement</i> with one of the following <i>value URIs</i> taken from the Eprints EntityType Vocabulary Encoding Scheme corresponding to the entity being described.																
Value (Non-Literal)	<table border="1"><thead><tr><th colspan="2">Value URI Constraint:</th></tr></thead><tbody><tr><td>Occurrence</td><td>mandatory</td></tr><tr><td>Choose from:</td><td>http://purl.org/eprint/entityType/ScholarlyWork/</td></tr><tr><th colspan="2">Vocabulary Encoding Scheme Constraint</th></tr><tr><td>Occurrence:</td><td>mandatory</td></tr><tr><td>Choose from:</td><td>http://purl.org/eprint/entityType/</td></tr><tr><th colspan="2">Value String Constraint:</th></tr><tr><td>Max occurrence</td><td>0</td></tr></tbody></table>	Value URI Constraint:		Occurrence	mandatory	Choose from:	http://purl.org/eprint/entityType/ScholarlyWork/	Vocabulary Encoding Scheme Constraint		Occurrence:	mandatory	Choose from:	http://purl.org/eprint/entityType/	Value String Constraint:		Max occurrence	0
Value URI Constraint:																	
Occurrence	mandatory																
Choose from:	http://purl.org/eprint/entityType/ScholarlyWork/																
Vocabulary Encoding Scheme Constraint																	
Occurrence:	mandatory																
Choose from:	http://purl.org/eprint/entityType/																
Value String Constraint:																	
Max occurrence	0																

For example:

```
Statement (
  Property URI ( dc:type )
  Vocabulary Encoding Scheme URI ( eprint:EntityType )
  Value URI ( <http://purl.org/eprint/entityType/ScholarlyWork> )
)
```



Metadata vocabularies, built on RDF





Free choice of (model-based) syntax

