# EXDIOTE Share Magnify

DCMI Conference Austin, TX

October 10th 2014

# **Extending Schema.org**

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Technology Evangelist

@rjw







# Representing the collective collection in WorldCat Discovery and WorldCat.org



# Representing the collective collection in WorldCat Discovery and WorldCat.org





Bibliographic information in WorldCat

**322+ million** bibliographic records

**2+ billion** holdings



Licensed digital content/articles in library collections

980million records



Digitized local library content

**38 million** items (Institutional repositories, Google, HathiTrust, OAlster)







Linking with hubs of authority on the web



- Linking with hubs of authority on the web
  - viaf.org persons



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  - Library of congress subjects, etc



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### **Conclusions**

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## Conclusions

Linked Data

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# fairly obvious

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# troducing



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  - Records held in Marc
- Identify the entities



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# roducin

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#### Phase 2

Model what is of interest to the Web



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  - All our data is important to us



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# Loducin

## Phase 1

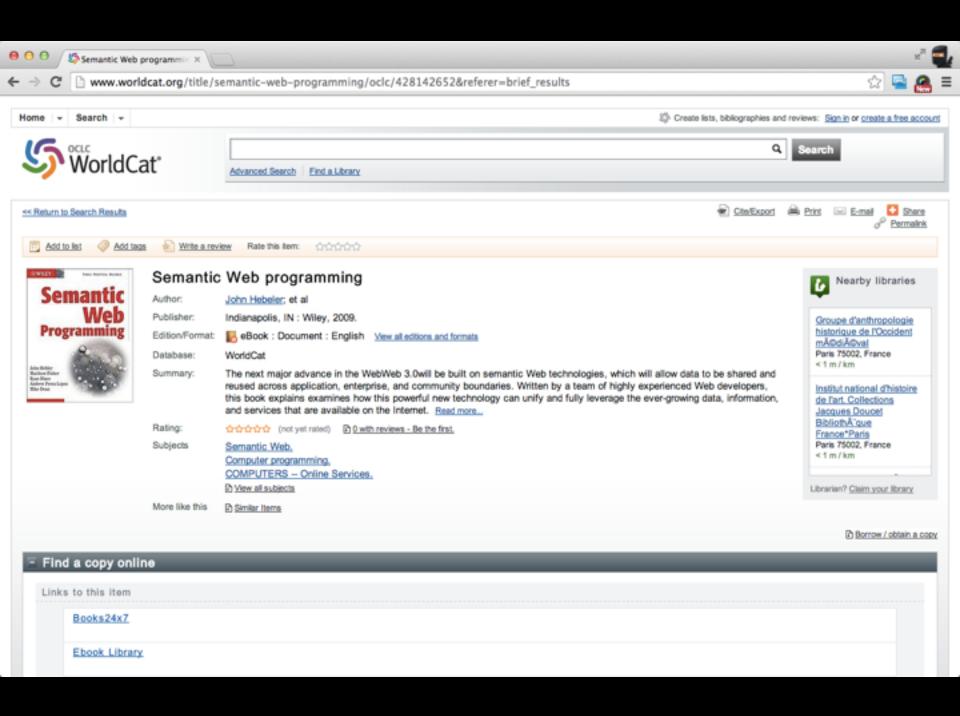


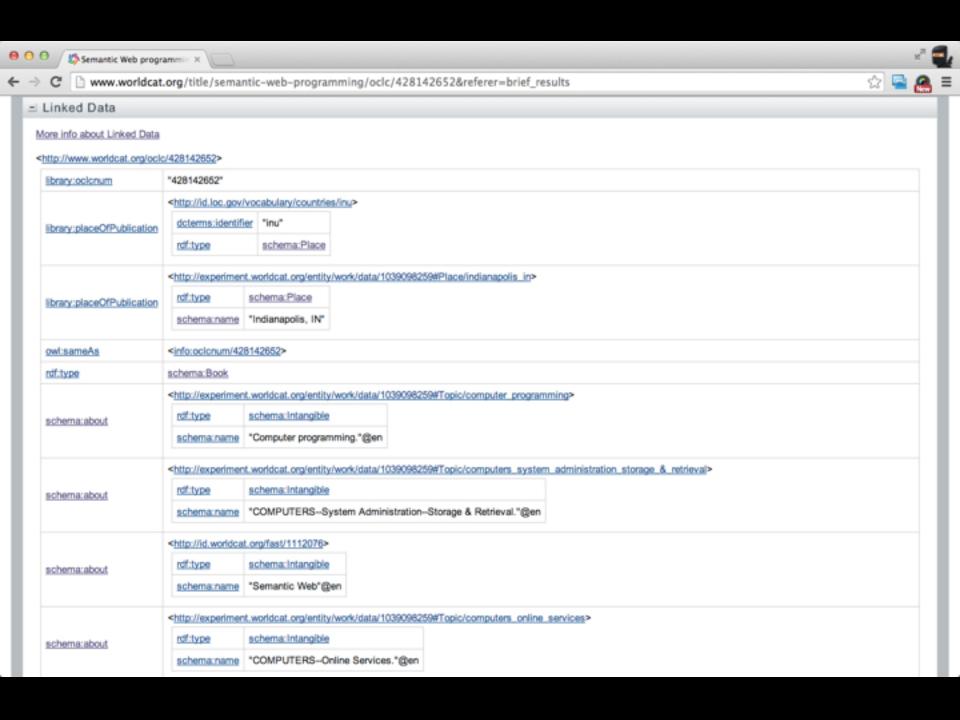
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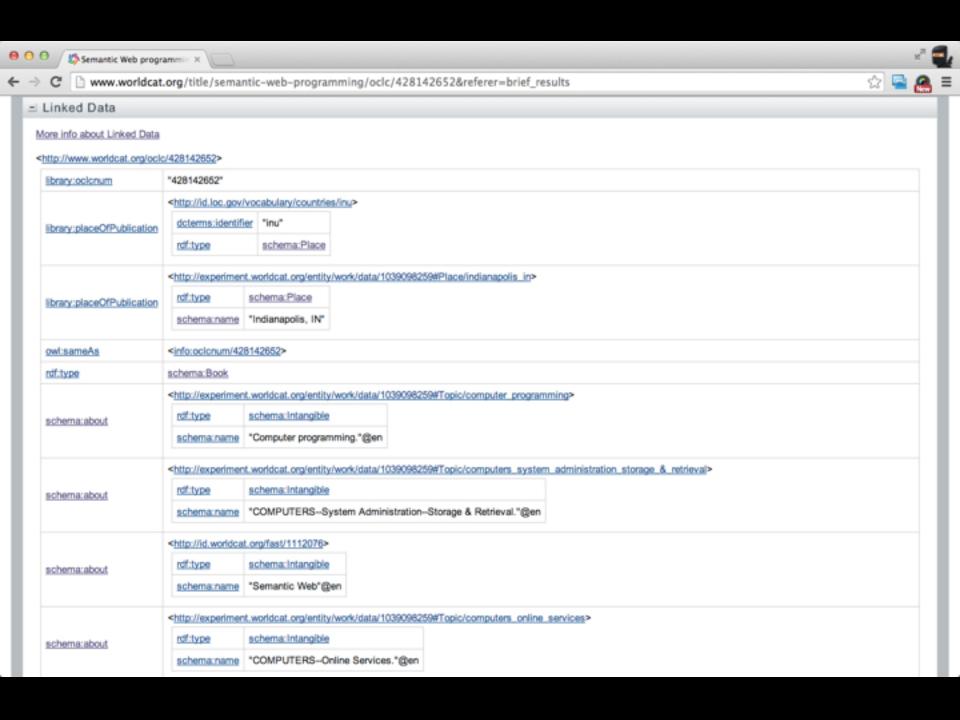
### Phase 2

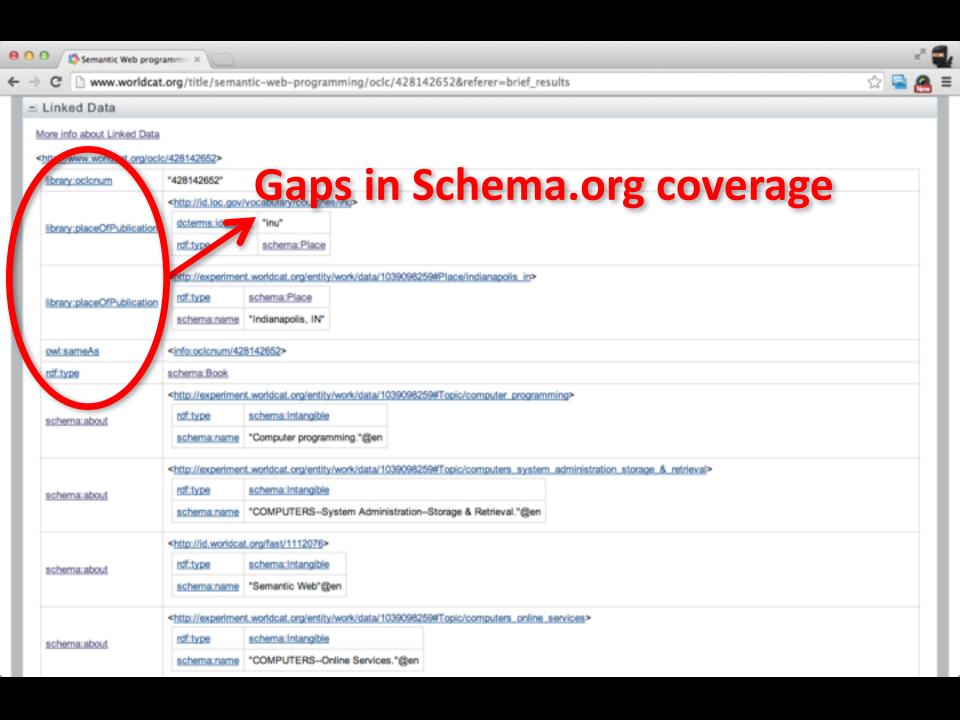
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## Phase 3 - Try it out!









# What to do about

Gaps in Schema.org coverage







Lobby them for updates / extensions



# Lobby them for updates / extensions

W3C home > Mailing lists > Public > public-vocabs@w3.org > August 2014

### public-vocabs@w3.org from August 2014 by subject

170 messages: Starting Friday, 1 August 2014 06:52:50 UTC, Ending Friday, 15 August 2014 22:40:08 UTC sort by: [thread] [author] [date] [subject]

Mail actions: [mail a new topic]

Help: [How to use the archives] [Search in the archives]

- [ISWC2014] Student Travel Grants Application
  - Mauro Dragoni (Saturday, 2 August)
- Buyer/Seller/Provider Re-Design
  - Jamo van Driel (Friday, 15 August)
  - Wallis, Richard (Friday, 15 August)
  - Dan Brickley (Friday, 15 August)
  - O elf Pavlik (Thursday, 14 August)
  - Wallis, Richard (Thursday, 14 August)
  - Dan Brickley (Thursday, 14 August)
  - mfhepp@gmail.com (Thursday, 7 August)
  - o elf Pavlik o (Sunday, 3 August)
  - Jamo van Driel (Friday, 1 August)
  - Aaron Bradley (Friday, 1 August)
  - Vicki Tardif Holland (Friday, 1 August)
  - Aaron Bradley (Friday, 1 August)
  - Jason Johnson (BING) (Friday, 1 August)
- Comics as Periodicals
  - Liddy Nevile (Thursday, 14 August)
  - Dan Brickley (Thursday, 14 August)
- Correct markup for Image Galleries?



# Lobby them for updates / extensions





- welcome also!

# Lobby them for updates / extensions

Proposals and Discussion [edit]					
These proposals are working towards inclusion in schema.org.					
Topic	Status	Summary			
Re-Design Provider / Seller vocabulary	Proposal	Address the issues / confusion in the relationship between provider and seller			
Change domain of associatedMedia to Thing	Proposal	Change the domain of http://schema.org/associatedMedia & to http://schema.org/Thing &			
Property-Value Pairs	Proposal	Adding support for arbitrary property-value pairs. Useful for product features and proprietary features of places.			



Lobby them for updates / extensions

http://lists.w3.org/Archives/Public/public-vocabs

http://www.w3.org/wiki/WebSchemas



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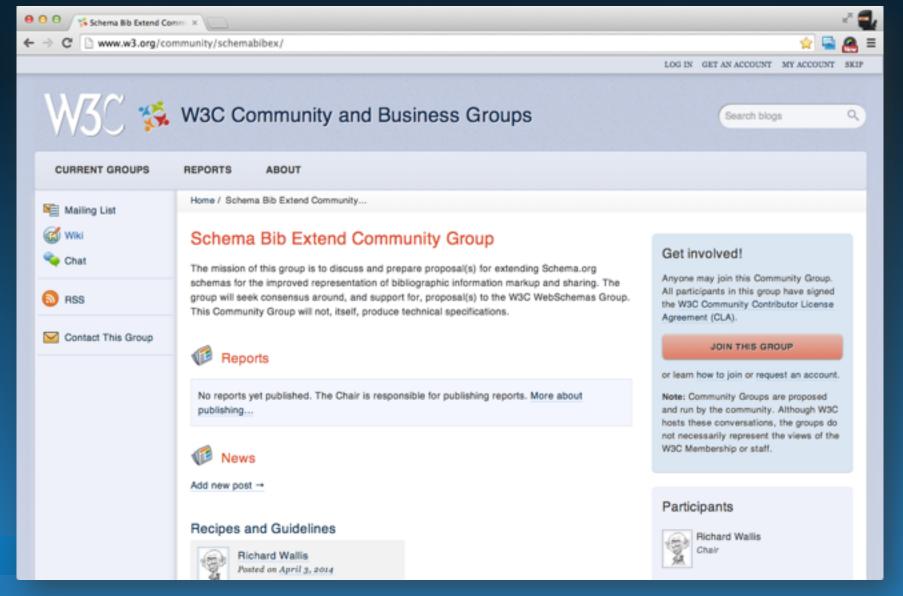
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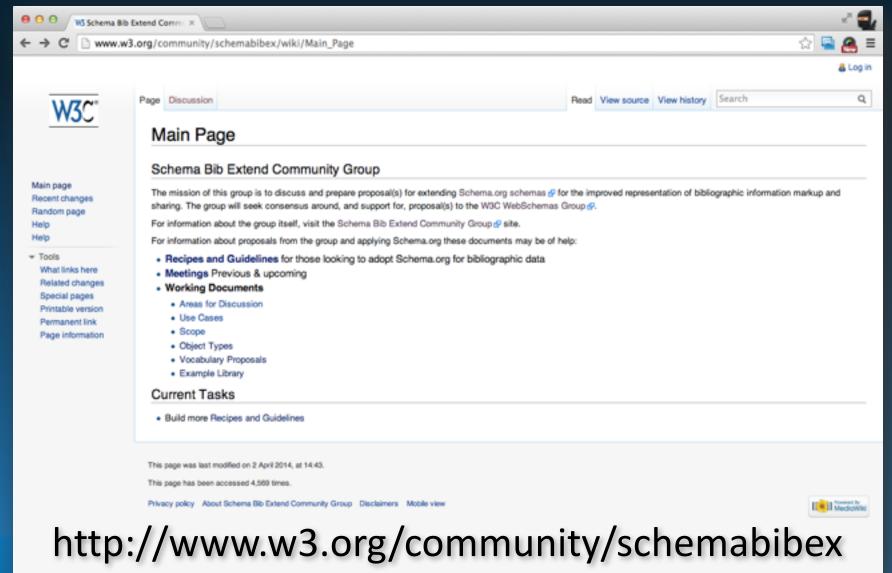
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... or form a group to do it



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Not everything is appropriate for Schema.org



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So I'll create my own vocabulary then!





But doesn't that loose all the benefits of Schema?



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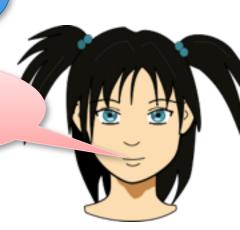


Not if it is an extension vocabulary





Just add your terms with Schema at the core



But doesn't that loose all the benefits of Schema?





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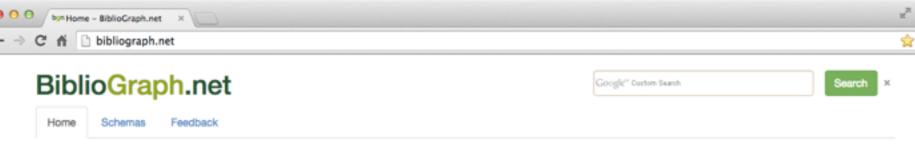


Just add your terms with Schema at the core

Like frosting on a cake?

# Frosting on the Schema.org Cake





### What is BiblioGraph.net?

This site provides a collection of schemas that are used to describe concepts, entities, and relationships for bibliographic and cultural heritage resources and collections, in libraries and associated domains. Based on the <a href="schema.org">schema.org</a> vocabulary, BiblioGraph.net adds terms and entities that are particularly relevant and important within these more specific domains.

It is designed to be used by organizations in the bibliographic field to describe resources that they curate, aggregate, describe and reference for local use, or to serve as authoritative hubs of knowledge about these items. Such organizations will benefit from the use of the BiblioGraph.net vocabulary through greater exposure, consumption, sharing, discovery, integration, navigation and display of bibliographic related information across the web.

With schema.org forming its foundation, BiblioGraph.net helps remove data integration barriers by enabling search engines to consume semantic data directly, making it easier for people and systems to find the information they seek. It also helps facilitate the integration of structured data between libraries and other information hubs, providing rich discovery, navigation and browsing experience of resources offered by libraries and associated organizations.

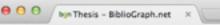
Based on a set of shared principles BiblioGraph.net, initially sponsored by OCLC, is shared with the greater bibliographic community, with the objective of improving access to, and dissemination and discovery of, the world's information.

We invite you to get started!

If you have any questions or comments contact info@bibliograph.net.

BiblioGraph.net Terms and Conditions













Google" Curtom Search

Search

Home

Schemas

Feedback

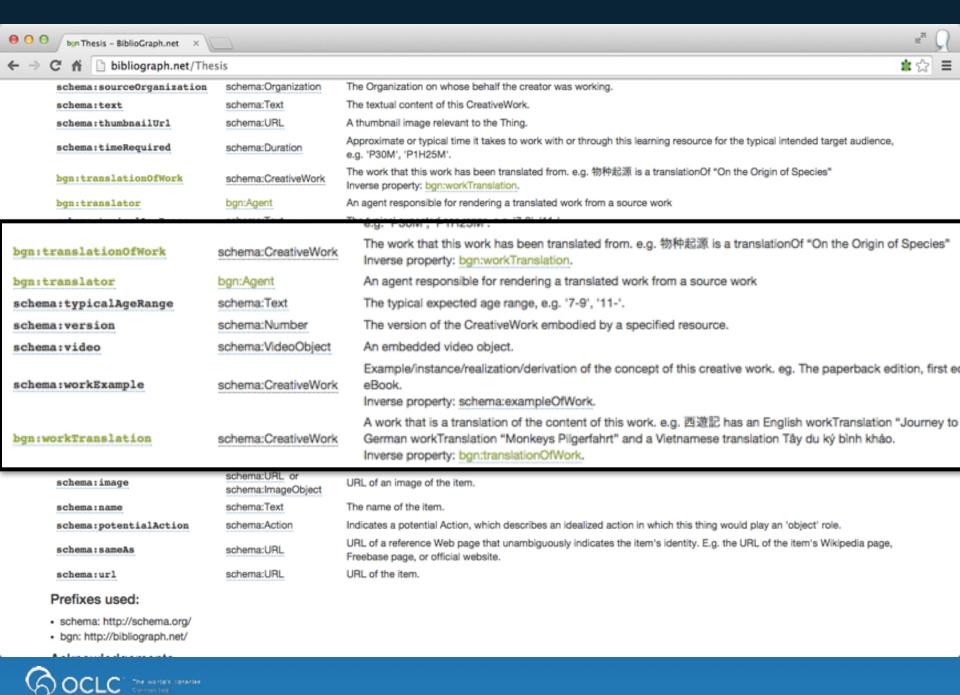
### **Thesis**

### schema:Thing > schema:CreativeWork > bgn:Thesis

A thesis or dissertation document submitted in support of candidature for an academic degree or professional qualification.

	Property	Expected Type	Description	
	Properties from bgn:Thesis			
	bgn:inSupportOf	schema:Text	Qualification, candidature, degree, application that Thesis supports.	
Properties from schema:CreativeWork				
	schema:about	schema:Thing	The subject matter of the content.	
	schema:accessibilityAPI	schema:Text	Indicates that the resource is compatible with the referenced accessibility API (WebSchemas wiki lists possible values).	
	schema:accessibilityControl	schema:Text	Identifies input methods that are sufficient to fully control the described resource (WebSchemas wiki lists possible values).	
	schema:accessibilityPeature	schema:Text	Content features of the resource, such as accessible media, alternatives and supported enhancements for accessibility (WebSchemas wiki lists possible values).	
	schema:accessibilityMazard	schema:Text	A characteristic of the described resource that is physiologically dangerous to some users. Related to WCAG 2.0 guideline 2.3. (WebSchemas wiki lists possible values)	
	schema:accountablePerson	schema:Person	Specifies the Person that is legally accountable for the CreativeWork.	
	schema:aggregateRating	schema:AggregateRating	The overall rating, based on a collection of reviews or ratings, of the item.	
	schema:alternativeMeadline	schema:Text	A secondary title of the CreativeWork.	
	schema:associatedMedia	schema:MediaObject	A media object that encodes this CreativeWork. This property is a synonym for encoding.	
	schema:audience	schema:Audience	The intended audience of the item, i.e. the group for whom the item was created.	
	schema:audio	schema:AudioObject	An embedded audio object.	
	schema:author	schema:Organization or schema:Person	The author of this content. Please note that author is special in that HTML 5 provides a special mechanism for indicating authorship via the rel tag. That is equivalent to this and may be used interchangeably.	
	schema:award	schema:Text	An award won by this person or for this creative work. Supercedes schema:awards.	
	schema:citation	schema:Text or schema:CreativeWork	A citation or reference to another creative work, such as another publication, web page, scholarly article, etc.	
	schema:comment	schema:Comment or	Comments, typically from users, on this CreativeWork.	













# BiblioGraph.ne Extension Vocabulary

Search

Home

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schema:accessibilityFeature	schema:Text	Content features of the resource, such as accessible media, alternatives and supported enhancements for accessibility (WebSchemas wiki lists possible values).
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schema:accountablePerson	schema:Person	Specifies the Person that is legally accountable for the CreativeWork.
schema:aggregateRating	schema:AggregateRating	The overall rating, based on a collection of reviews or ratings, of the item.
schema:alternativeHeadline	schema:Text	A secondary title of the CreativeWork.
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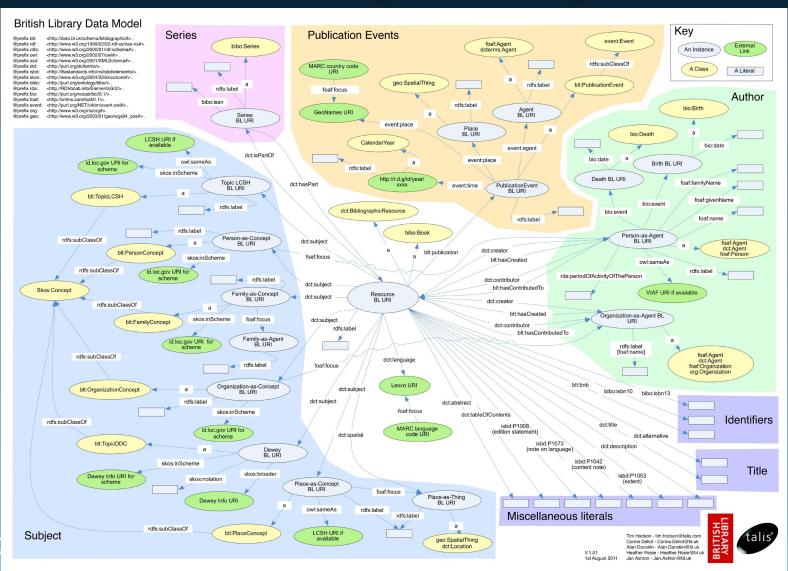
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  - Eases adoption
- Repeatable pattern



### Namespace Proliferation









### British Library Data Model

```
@prefix blt: <http://data.bl.uk/schema/bibliographic#> .
```

@prefix rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#> .

@prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#> .

@prefix owl: <http://www.w3.org/2002/07/owl#> .

@prefix xsd: <http://www.w3.org/2001/XMLSchema#> .

@prefix dct: <http://purl.org/dc/terms/> .

@prefix isbd: <http://iflastandards.info/ns/isbd/elements/> .

@prefix skos: <a href="http://www.w3.org/2004/02/skos/core#">http://www.w3.org/2004/02/skos/core#>.

@prefix bibo: <http://purl.org/ontology/bibo/> .

@prefix rda: <a href="http://RDVocab.info/ElementsGr2/">http://RDVocab.info/ElementsGr2/</a>.

@prefix bio: <http://purl.org/vocab/bio/0.1/> .

@prefix foaf: <http://xmlns.com/foaf/0.1/> .

@prefix event: <a href="http://purl.org/NET/c4dm/event.owl#">http://purl.org/NET/c4dm/event.owl#>.</a>

@prefix org: <http://www.w3.org/ns/org#> .

@prefix geo: <http://www.w3.org/2003/01/geo/wgs84\_pos#> .



# British Library Oseta Model @prefix blt: http://www.us2.cra/topa/caphic#>.

/www.w3.org/1999/02/22-rdf-syntax-ns#>.

<a href="http://www.w3.org/2000/01/rdf-schema#">http://www.w3.org/2000/01/rdf-schema#>.</a>

<a href="http://www.w3.org/2002/07/owl#">...

@prefix xsd: <a href="http://www.w3.org/2001/XMLSchema#">http://www.w3.org/2001/XMLSchema#>.</a>

@prefix dct: <a href="http://purl.org/dc/terms/">http://purl.org/dc/terms/">.</a>

@prefix isbd: <a href="http://iflastandards.info/ns/isbd/elements/">http://iflastandards.info/ns/isbd/elements/</a>.

@prefix skos: <a href="http://www.w3.org/2004/02/skos/core#">http://www.w3.org/2004/02/skos/core#>.</a>

@prefix bibo: <a href="http://purl.org/ontology/bibo/">http://purl.org/ontology/bibo/>.</a>

<a href="http://RDVocab.info/ElementsGr2/">http://RDVocab.info/ElementsGr2/>.</a> @prefix rda:

@prefix bio: <a href="http://purl.org/vocab/bio/0.1/">...

<a href="http://xmlns.com/foaf/0.1/">. <a href="http://xm @prefix foaf:

@prefix event: <a href="http://purl.org/NET/c4dm/event.owl">http://purl.org/NET/c4dm/event.owl">.</a>

<a href="http://www.w3.org/ns/org#">http://www.w3.org/ns/org#>.</a> @prefix org:

<a href="http://www.w3.org/2003/01/geo/wgs84\_pos#">http://www.w3.org/2003/01/geo/wgs84\_pos#>.</a> @prefix geo:



```
British Library Oseta Model

@prefix blt: httpS/data.bl.uk/schema/biblicerephic#>.
                                                             /2001/XMLSchema#>.
                                   p://purl.org/dc/terms/>.
                            <a href="http://iflastandards.info/ns/isbd/elements/">http://iflastandards.info/ns/isbd/elements/</a>.
@prefix skos:
                            <a href="http://www.w3.org/2004/02/skos/core#">http://www.w3.org/2004/02/skos/core#>.</a>
@prefix bibo:
                            <a href="http://purl.org/ontology/bibo/">http://purl.org/ontology/bibo/>.</a>
@prefix rda:
                            <a href="http://RDVocab.info/ElementsGr2/">http://RDVocab.info/ElementsGr2/>.</a>
@prefix bio:
                            <a href="http://purl.org/vocab/bio/0.1/">http://purl.org/vocab/bio/0.1/>.</a>
```

<a href="http://xmlns.com/foaf/0.1/">. <a href="http://xm @prefix foaf: @prefix event: <a href="http://purl.org/NET/c4dm/event.owl">http://purl.org/NET/c4dm/event.owl">.</a>

@prefix org: <a href="http://www.w3.org/ns/org#">http://www.w3.org/ns/org#>.</a>

<a href="http://www.w3.org/2003/01/geo/wgs84\_pos#">http://www.w3.org/2003/01/geo/wgs84\_pos#>.</a> @prefix geo:



## British Library Oseta Model @prefix blt: | State State | Dept. | Dept

```
<a href="http://www.w3.org/2003/01/geo/wgs84_pos#">http://www.w3.org/2003/01/geo/wgs84_pos#>.</a>
@prefix geo:
```





@prefix bgn: <http://bibliograph.net/>

Not as good as a single namespace



- Not as good as a single namespace
- But next best thing and understandable by:



- Not as good as a single namespace
- But next best thing and understandable by:
  - my domain



- Not as good as a single namespace
- But next best thing and understandable by:
  - my domain
  - the rest of the world mostly



- Not as good as a single namespace
- But next best thing and understandable by:
  - my domain
  - the rest of the world mostly



An extension to Schema.org...

• to fill in some [temporary?] domain specific gaps

- to fill in some [temporary?] domain specific gaps
- light weight access to rich data

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- complementary [rest of the world friendly] An extension to Schema.org...
- an example of how others might do it.

#### **OCLC Entity Based Data Strategy**



#### **OCLC Entity Based Data Strategy**

√ VIAF, ISNI, FAST Publish Linked Data



- **✓ VIAF, ISNI, FAST Publish Linked Data**
- ✓ WorldCat.org Linked Data Release using Schema.org



- **✓ VIAF, ISNI, FAST Publish Linked Data**
- ✓ WorldCat.org Linked Data Release using Schema.org
- ✓ Internal agreement on data strategy



- ✓ VIAF, ISNI, FAST Publish Linked Data
- ✓ WorldCat.org Linked Data Release using Schema.org
- ✓ Internal agreement on data strategy
- **√** Evangelism



- **✓ VIAF, ISNI, FAST Publish Linked Data**
- ✓ WorldCat.org Linked Data Release using Schema.org
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- **√** Evangelism
- ✓ Research & Design with Data Architecture Group



- **✓ VIAF, ISNI, FAST Publish Linked Data**
- **√** WorldCat.org Linked Data Release using Schema.org
- ✓ Internal agreement on data strategy
- **√** Evangelism
- ✓ Research & Design with Data Architecture Group
- **✓** Data mining of WorldCat resources



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- √ WorldCat Works Released

2014

2012



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### **≻**Application Integration

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#### **➤**More Entities Released

- ➤ Person
- ➤ Organization
- ➤ Event
- ➤ Concept

2015

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# **Structured Data Objectives**

fairly obvious

# Conclusions

- Linked Data
  - RDF RDFa, RDF/XML, JSON-LD, Turtle, nTriples
  - Canonical URIs
- Schema.org + BiblioGraph.net
  - Core widely adopted & understood 15% of web sites



# **Structured Data Objectives**

- Widely distributed & understood
  - Web standard data access patterns
  - Common vocabularies on the web
  - Visibility in search engines

fairly obvious

# Conclusions

- Linked Data
  - RDF RDFa, RDF/XML, JSON-LD, Turtle, nTriples
  - Canonical URIs
- Schema.org + BiblioGraph.net
  - Core widely adopted & understood 15% of web sites



# Explore. Share. Magnify.





