



RHODES UNIVERSITY

# Exploring and implementing Open Linked Data record creation on the Rhodes Digital Commons

NeDICC Meeting

4 July 2018

CSIR Knowledge Commons

Pretoria



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Rhodes University

# Content

- The Sematic Web
- Linked Data
- MODS Linked Data records
- Tips and Tools
- References and proposed reading list

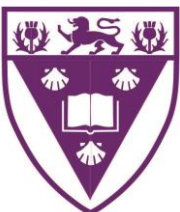


# Disclaimer


- Processes, value and impact still being investigated
- Still experimenting and learning
- Supporting policies not fully implemented
- Need input from community
- Investigate collaborative opportunities



# The Semantic Web



# The Semantic Web



To a computer, the Web is a flat, boring world, devoid of meaning. This is a pity, as in fact documents on the Web describe real objects and imaginary concepts. [...]

**Adding** semantics to the Web involves two things: allowing documents which have information in **machine-readable** forms, and allowing links to be created with **relationship values**. Only when we have this extra level of semantics we will be able to use computer power to help us exploit the information to a greater extent than our own reading.

TIM BERNERS-LEE, 1994



# Semantic Web

Vision:

- To provide information in a **machine-interpretable** format in order to enable intelligent agents to act on our behalf through interpretation of the relationships between objects



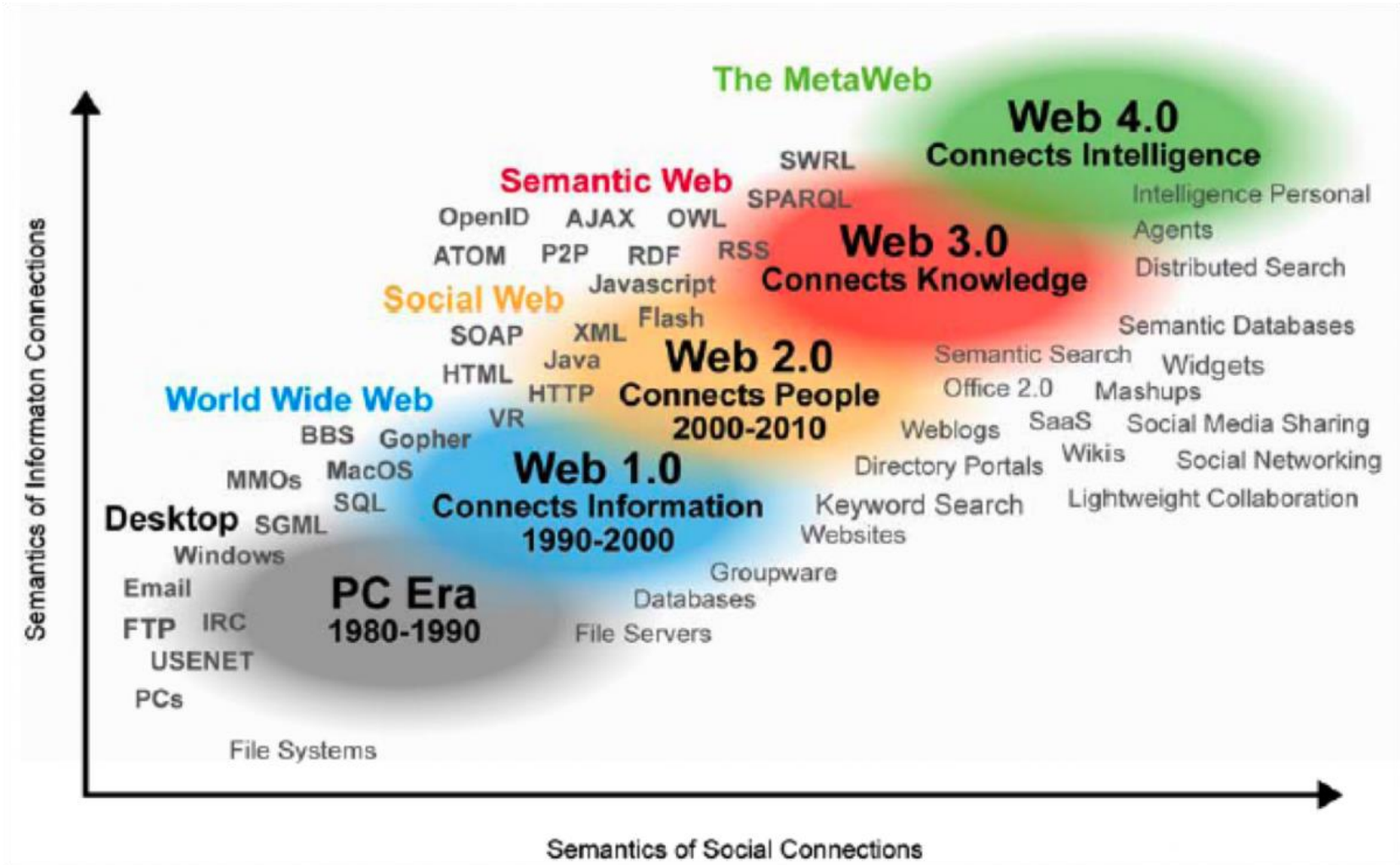
# Semantic Web

Aims (Breslin 2010)

- From a “Web of Documents” to a “Web of Data”
- Enabling machine-readable knowledge at Web scale

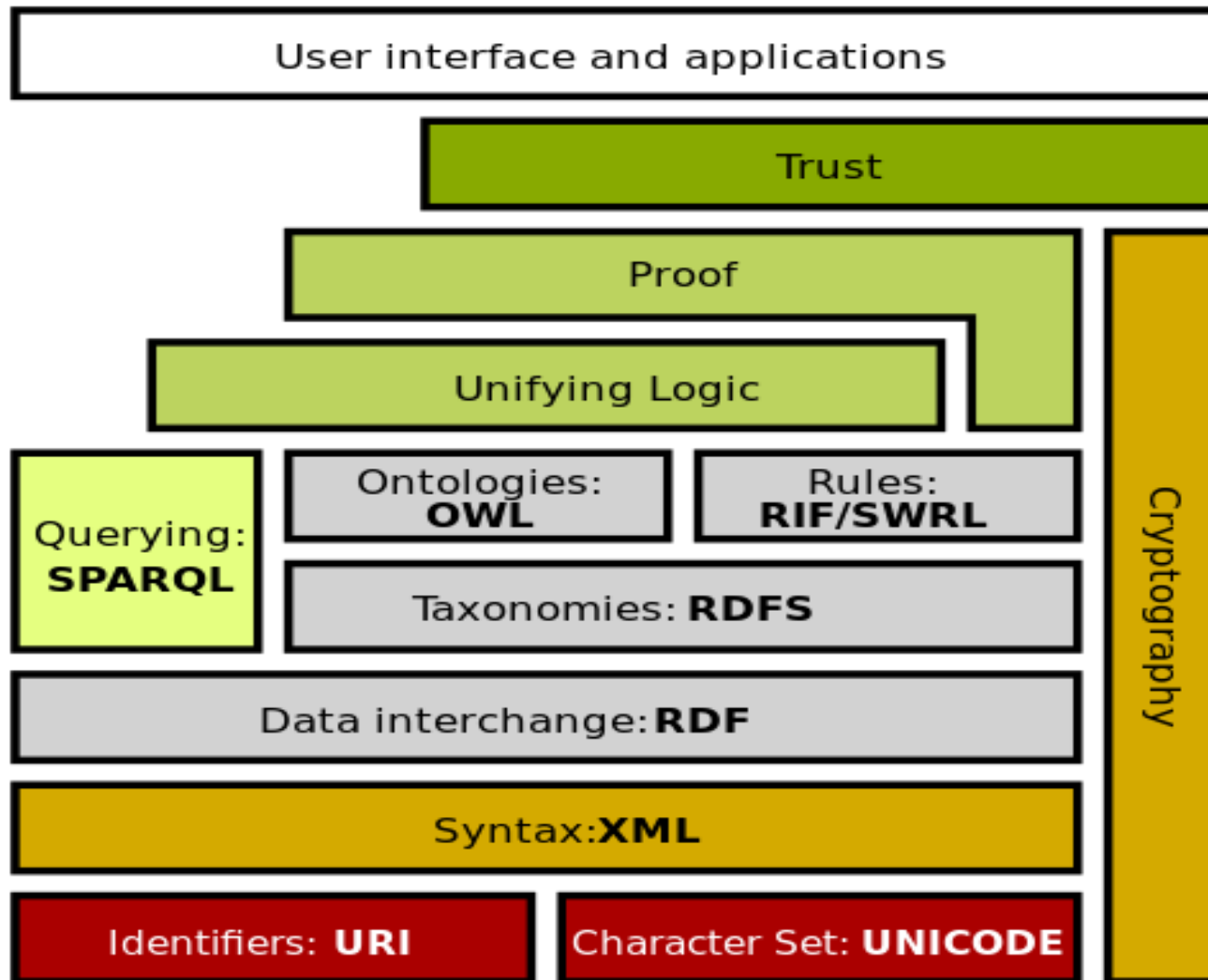


# Web Evolvment

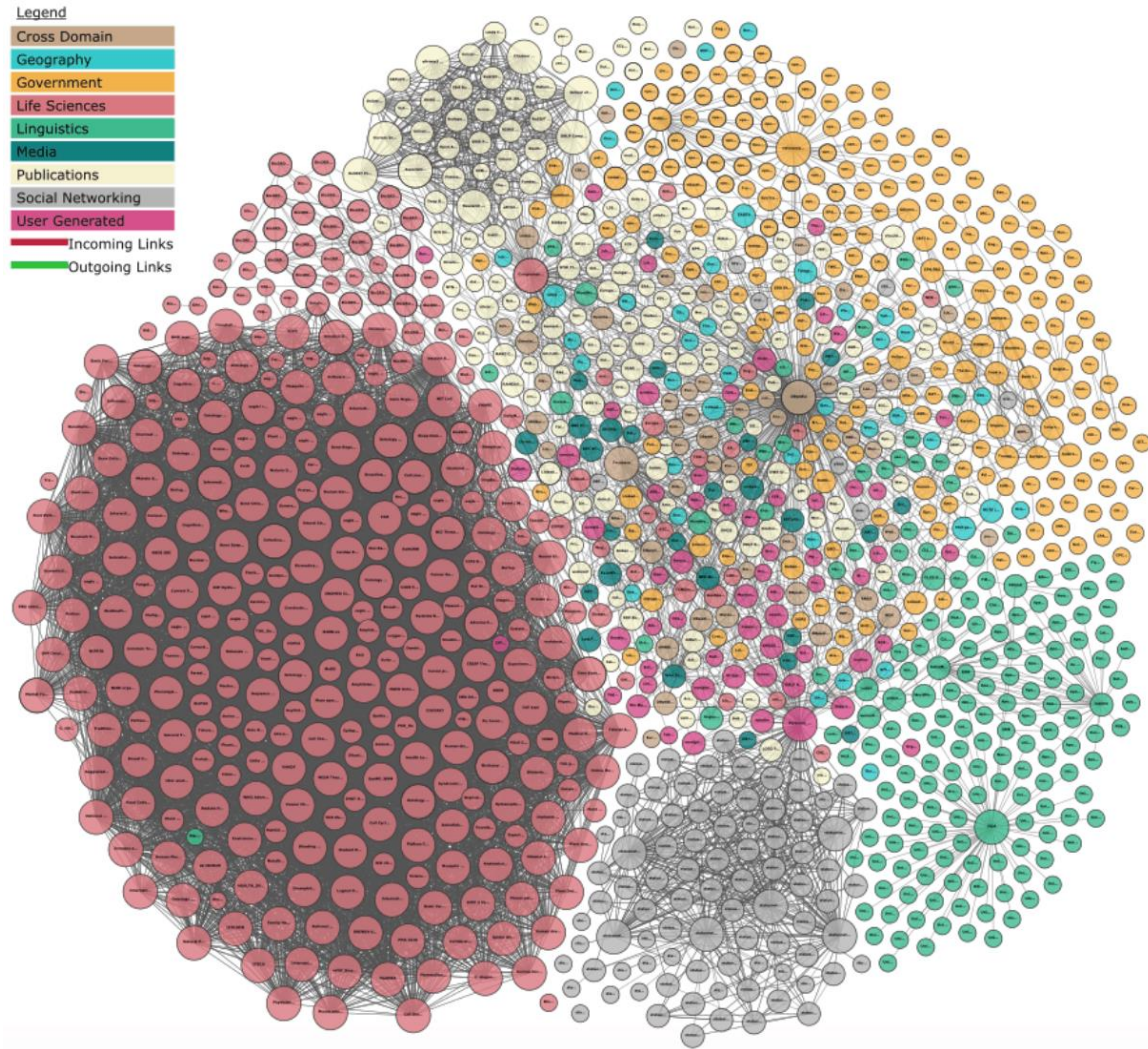




# Semantic Web Stack



# Linked Data



# Linked Data

- Linked Data Records:
  - Adhere to ‘*Set of best practices for the publication of data on the web*’ (Van Hooland & Verborgh 2014)
  - Are records where certain relationships are established and expressed through identifiers
  - Aim to link all metadata fields in a meaningful manner



# Linked Data - Principles of

- Tim Berners-Lee (2009)
  - URIs for names: Any conceptual thing (people, events etc.) can have a name (URI) on the web
  - HTTP protocol: Information is interchanged in a standard format
  - Includes explicit relationships to other things (via URIs)



# Linked Data

- Linked Data Records are:
  - However:
    - Not really implying all metadata fields?
    - Not a ‘well defined technology’ or single technological solution
    - Not a single standard

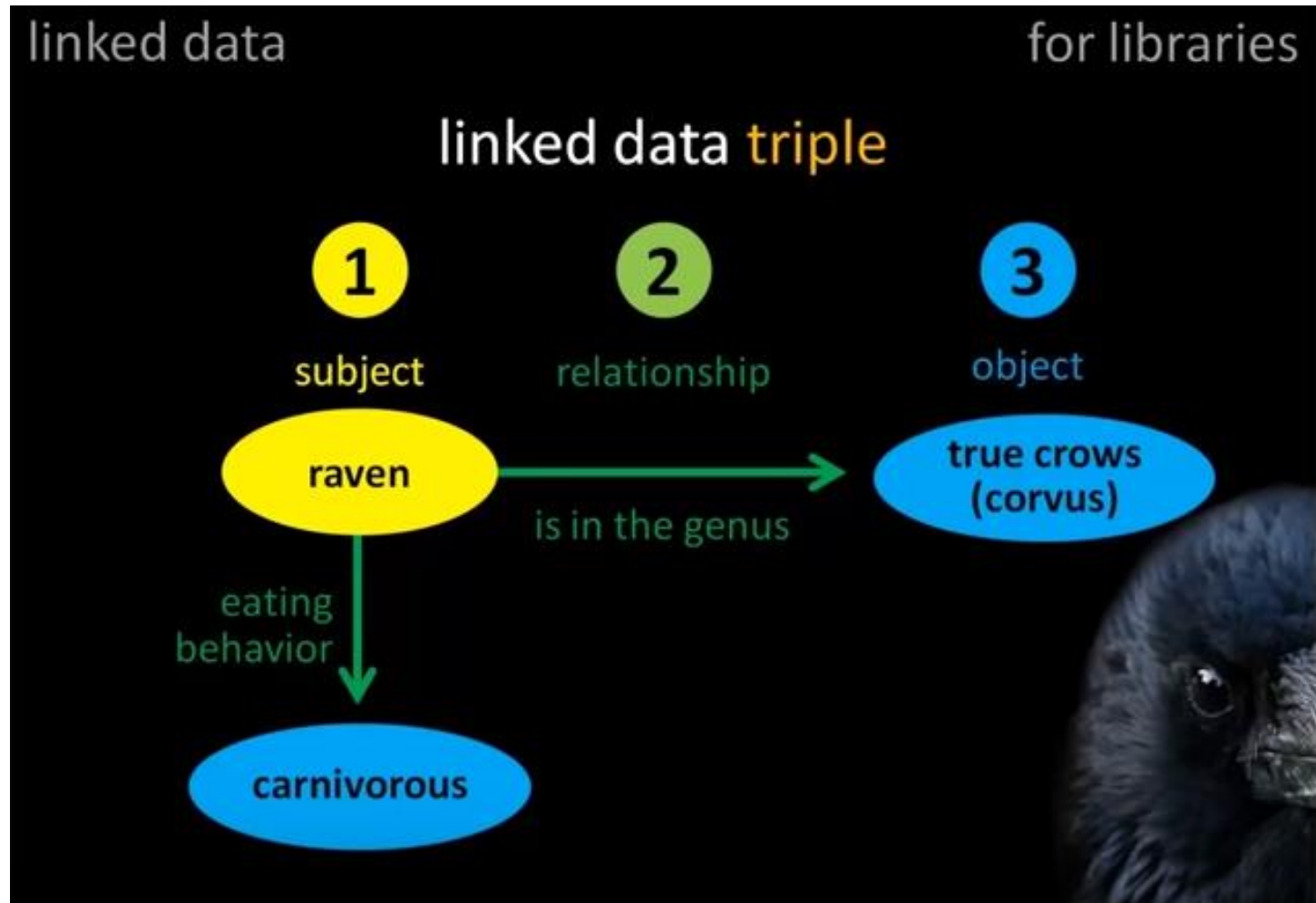


# Linked Data - Key words

- RDF: Resource Description Framework – a metadata data model specification
- Triple: Atomic data entity in the RDF data model – codifies subject-predicate-object expressions
- URI: Uniform Resource Identifier – unique identifier for anything or concept on the Web or elsewhere (OCLC 2012)



# How does it work?



# Linked Data - importance for Libraries?

- Linked Data in Context of Knowledge Engineering in relation to the Semantic Web
  - Data Collation
  - Data Visibility
  - Data Accessibility (Expression)
  - Data Diffusion
  - Data Integration
  - Data Interoperability
  - Data Interpretability
  - Data Use/Re-use





# Linked Data - importance for Libraries?

- Library resources are better exposed and discoverable
- Applications can integrate with data and services can be developed based on this (BBC and Nature)
- Integration within cataloguing for increased effectiveness
- Disambiguate concepts



# Linked Data – Rhodes Case



# Linked Data – Rhodes Case

- Understand the basic principles
- Understand and agree with the potential value
- But how to go about linking our data?



# Linked Data

CLIR

Fellowships & Grants

DLF

Publications

Join

Give ♥

CLIR Programs ▾



About

Events

Resources

Groups

Opportunities

Contact

Join DLF



## LinkedData

Home / LinkedData

### Linked Data: A Personal View from Jerry Persons

📅 JUNE 18, 2012 👤 CROWELL

📁 COMMUNITY, INTEREST GROUPS, LINKEDDATA, NEWS



—

This piece inaugurates an occasional series by or about linked data practitioners that will be cross-posted on the DLF site and LOD-LAM.net. The first post in the series is...

[Read More >>](#)

### Announcing a LOD-LAM Zotero Group

📅 MAY 24, 2012 👤 CROWELL

📁 COMMUNITY, INTEREST GROUPS, LINKEDDATA, NEWS

—

The Digital Library Federation, together with LITA's Linked Library Data Interest Group, is pleased to announce an open Zotero group for LOD-LAM tools and resources. The LOD-LAM Zotero group...

[Read More >>](#)

### Visualizing linked TV & bibliographic data

📅 OCTOBER 17, 2011 👤 CROWELL

📁 DPLA, LINKEDDATA, NEWS

—

In a recent post at danbri.org, Dan Brinkley documents some of his work on NoTube (a European research project exploring Semantic Web and TV), reflects on the possibilities of linking...

[Read More >>](#)



# Linked Data

- Thus question: Compliance to what?
  - Digital Library Federation (DLF)
    - International “Community of practitioners who advance research, learning, social justice, and the public good through the creative design and wise application of digital library technologies” (DLF: 2018)



# MODS Linked Data Records

- SEALS Digital Commons
  - Shared Institutional Repository
  - Migrated from Dublin Core (DC) to MODS in 2016
- MODS:
  - Metadata Object Description Schema (MODS)



# MODS Linked Data Records

- Critical fields in MODS Data Linked Records:
  - Creator
    - Creator type
  - Role Term
    - Contribution type
  - Genre
  - Language
  - Subject



# MODS Linked Data Records

- Creator

Lotz, Stefan (1) *See Personal Page*

Lotz, Stefanus Ignatius (1) *See Personal Page*

Lotz-Sisitka, H (5) *See Personal Page*

Lotz-Sisitka, Heila (10) *See Personal Page*

Loubser, Annette (1) *See Personal Page*

Loubser, C (1) *See Personal Page*

---

## Heila Lotz-Sisitka

### ORCID ID

 <https://orcid.org/0000-0002-5193-9881>

 [Print view](#) 

### Also known as

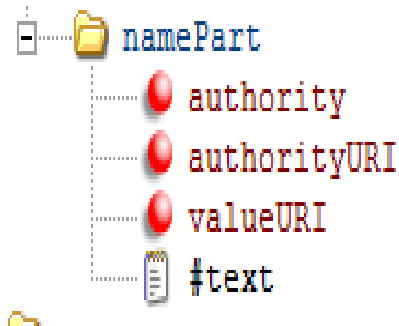
Heila Sisitka, Heila Lotz, H.B. Lotz-Sisitka, HB Lotz-Sisitka, H.B. Sisitka, H. Sisitka, H. Lotz, HB Lotz, HB Sisitka





# MODS Linked Data Records

- Creator
  - Authority – ORCID if not Library of Congress Name Authority File (LCNAF)

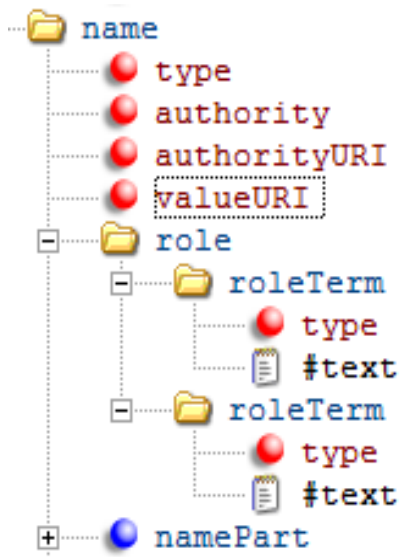


```
LCNAF
http://id.loc.gov/authorities/names/collection_LCNAF
http://id.loc.gov/authorities/names/nb2004009579.html
Lotz-Sisitka, Heila, 1965-
```



# MODS Linked Data Records

- Creator
  - Authority – **ORCID** if not Library of Congress Name Authority File (LCNAF)



```
personal
orcid
http://id.loc.gov/vocabulary/identifiers/orcid.html
https://orcid.org/0000-0002-1764-7340
code
aut
text
Author
Van der Walt, Wynand
```



# MODS Linked Data Records

VIAF

Virtual International Authority File

## Search

Select Field:

Personal Names

Select Index:





All VIAF

Search Terms:

Lotz Sisitka, Heila, 1965-




Search


1 heading found for *Lotz Sisitka, Heila, 1965-*

	Heading	Type	Sample Title
1	<a href="#">Lotz-Sisitka, Heila, 1965-</a>    <a href="#">Lotz-Sisitka, Heila</a> 	Personal	Critical realism, environmental learning and social-ecological change / edited b ... Environmental education, ethics and action in Southern Africa, 2002:



# MODS Linked Data Records

Lotz-Sisitka, Heila, 1965-   

Lotz-Sisitka, Heila 

VIAF ID: 56126634 (Personal)


Permalink: <http://viaf.org/viaf/56126634>

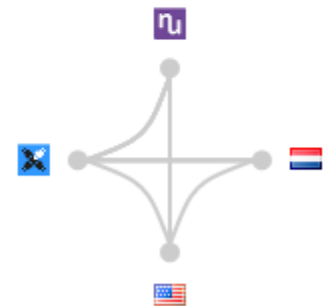
## Preferred Forms

 100 1 \_ [\\_1a Lotz-Sisitka, Heila](#)

 100 1 \_ [\\_1a Lotz-Sisitka, Heila Id \(1965- \)](#)

 100 1 \_ [\\_1a Lotz-Sisitka, Heila Id 1965-](#)

 100 1 \_ [\\_1a Lotz-Sisitka, Heila, Id 1965-](#)



# MODS Linked Data Records

- Role Term
  - Who was responsible for what aspect of the thing created

Title	<b>Jemeri</b>
Creator	Emmanuel Namuto and Oshikuku mission participants
Creator	Namuto, Emmanuel
Creator	Tracey, Andrew T N
Subject	Folk music -- Namibia
Subject	Ovambo (African people) -- Music
Subject	Sub-Saharan African music
Date	1982-11-03
Publisher	International Library of African Music
Description	Traditional song with clapping accompaniment.

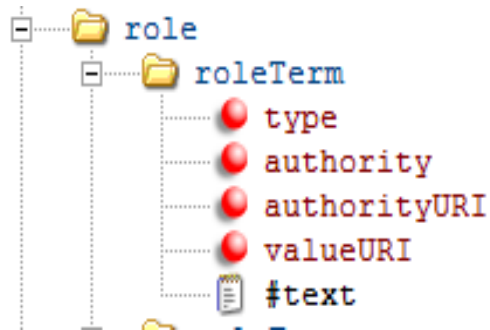
---

abstract	Traditional song with clapping accompaniment.
accessCondition (rights holder)	International Library of African Music
accessCondition (use and reproduction)	Use of this resource is governed by the terms and conditions of the I
roleTerm (marcrelator)	prf
roleTerm (text)	Performer
namePart	Emmanuel Namuto and Oshikuku mission participants
roleTerm (marcrelator)	cmp
roleTerm (text)	Composer
namePart	Namuto, Emmanuel
roleTerm (marcrelator)	rcd
roleTerm (text)	Recordist
namePart	Tracey, Andrew T N

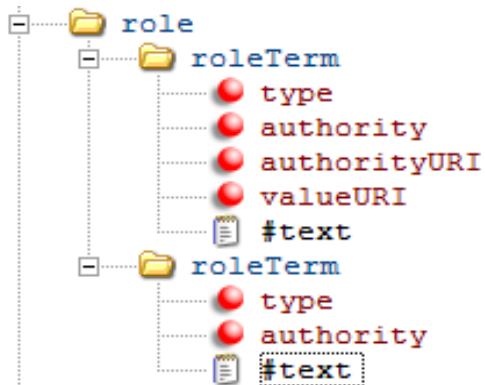


# MODS Linked Data Records

- Role Term
  - Authority – Marcrelators



```
code
marcrelator
http://id.loc.gov/vocabulary/relators.html
http://id.loc.gov/vocabulary/relators/aut
aut
```



```
code
marcrelator
http://id.loc.gov/vocabulary/relators.html
http://id.loc.gov/vocabulary/relators/ctb
ctb
```

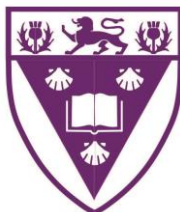
```
text
marcrelator
Contributor
```



# MODS Linked Data Records

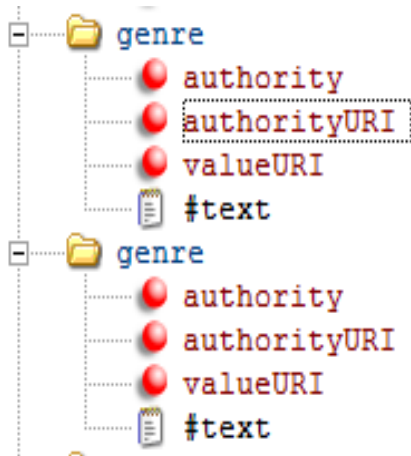
- Genre

namePart Tracey, Andrew T N  
genre (lcgft) [sound recordings](#)  
genre (lcgft) [folk music](#)  
publisher International Library of African Music  
dateIssued 1982-11-03



# MODS Linked Data Records

- Genre
  - Authority – MARC Genre terms (MARC GT) or LC Genre/Form Terms (LCGFT)



```
lcgft
http://id.loc.gov/authorities/genreForms.html
http://id.loc.gov/authorities/genreForms/gf2011026594
sound recordings
```

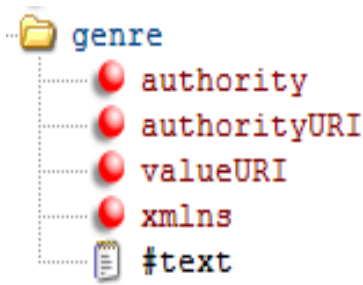
```
lcgft
http://id.loc.gov/authorities/genreForms.html
http://id.loc.gov/authorities/genreForms/gf2014026809
folk music
```



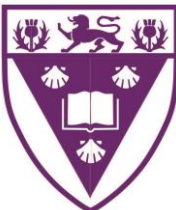


# MODS Linked Data Records

- Genre
  - Authority – MARC Genre terms (**MARCGT**) or LC Genre/Form Terms (LCGFT)



```
mrcgt
https://www.loc.gov/standards/valuelist/marcgt.html
https://www.loc.gov/standards/valuelist/marcgt.html
http://www.loc.gov/mods/v3
article
```



# MODS Linked Data Records

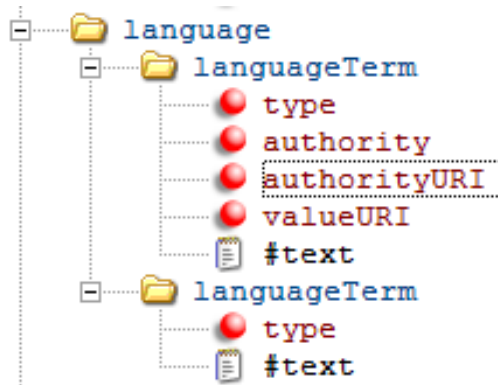
- Language
  - Authority – ISO 639 Series

Language	
English	(166)
Khoe	(22)
Tswana	(19)
Xhosa	(19)
Kuanyama	(13)
Shona	(13)
Chopi	(4)
Haya	(4)
Nyoro	(4)
Nyamwezi	(2)



# MODS Linked Data Records

- Language
  - Authority – ISO 639 Series



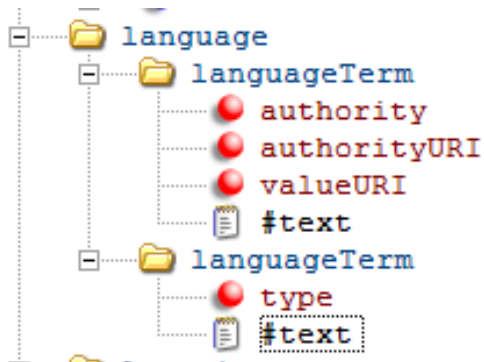
```
code
iso639-2b
-----
http://id.loc.gov/vocabulary/iso639-2.html
http://id.loc.gov/vocabulary/iso639-2/eng.html
eng

text
English
```



# MODS Linked Data Records

- Language
  - Authority – ISO 639 Series



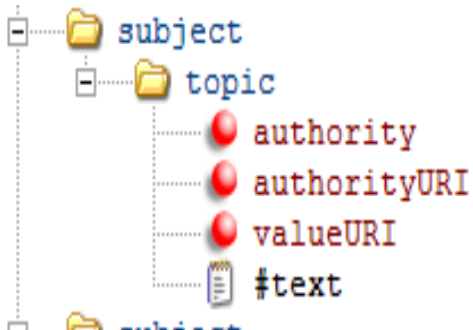
```
iso639-2b
http://id.loc.gov/vocabulary/iso639-2.html
http://id.loc.gov/vocabulary/iso639-2/kua
kua

text
Kuanyama
```



# MODS Linked Data Records

- Subject
  - Authority – LC Subject Headings (LCSH) or MARC Geographical Areas List (MARCGAC)

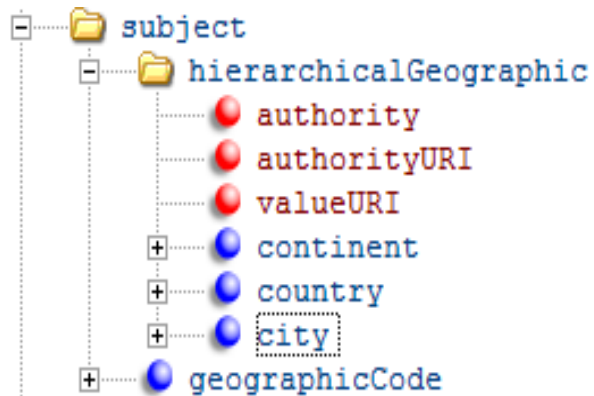


```
LCSH
http://id.loc.gov/authorities/subjects.html
http://id.loc.gov/authorities/subjects/sh85044169.html
Environmental education -- South Africa
```



# MODS Linked Data Records

- Subject
  - Authority – LC Subject Headings (LCSH) or MARC Geographical Areas List (MARC GAC)



```
marcgac
http://id.loc.gov/vocabulary/geographicAreas
http://id.loc.gov/vocabulary/geographicAreas/f-sz
Africa
Namibia
Oshikuku Mission, Omusati
f-sz
```



# Tips & Tools

- Design metadata templates per collection and sub-collections
- Investigate controlled vocabularies
  - Continual use of general / non-subject specific might impact negatively on information discoverability
  - LCSH vs
    - Systems Biology Ontology (SBO)
    - Kinetic Simulation Algorithm Ontology (KiSAO)
    - The Terminology for the Description of Dynamics (TEDDY)
- Experiment and test



# Tools

- **Linked Data Publishing Platforms/Frameworks**
  - [Talis Platform](#): the Talis Platform provides Linked Data-compliant hosting for content and RDF data
  - [Linked Media Framework](#): a Linked Data server with updates and semantic search
  - [PublishMyData](#): A Linked Data Publishing Platform run by [Swirrl](#).





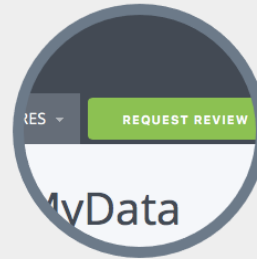
# Tools

## PublishMyData: World-class tools, whether you're a data publisher, consumer or app developer.



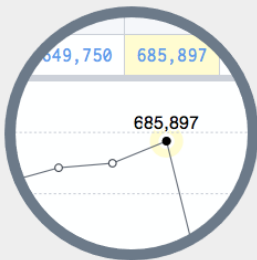
### Combine

Use the **data cart** to tailor custom downloads combining data from anywhere on the site.



### Collaborate

Share data inside and outside the organisation with built-in **team workflows** for data publishing and review.



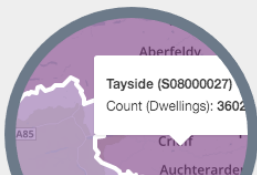
### Contextualise

Linked data lets you zoom between precise detail and the big picture with **context-aware charting**.



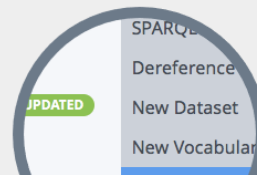
### Connect

Automatically-created **APIs** make your data re-usable by the world.



### Locate

Out-of-the-box understanding of UK **administrative geography**



### Curate

Programmable **authoring pipelines** make uploading new data effortless and



# Tools

- **Linked Data/RDF Editors and Validators**
  - [Hyena](#): RDF Editor
  - [Vapour](#): Linked Data Validator



# Tools

- **Tools for Consuming Linked Data**
  - [Semantic Web Browsers and Client Libraries](#)
  - [Semantic Web Search Engines](#)



# Tools

- **Linked Data Applications for End Users**
  - [Semantic Web Browsers and Client Libraries](#)
  - [Other Linked Data Applications](#)

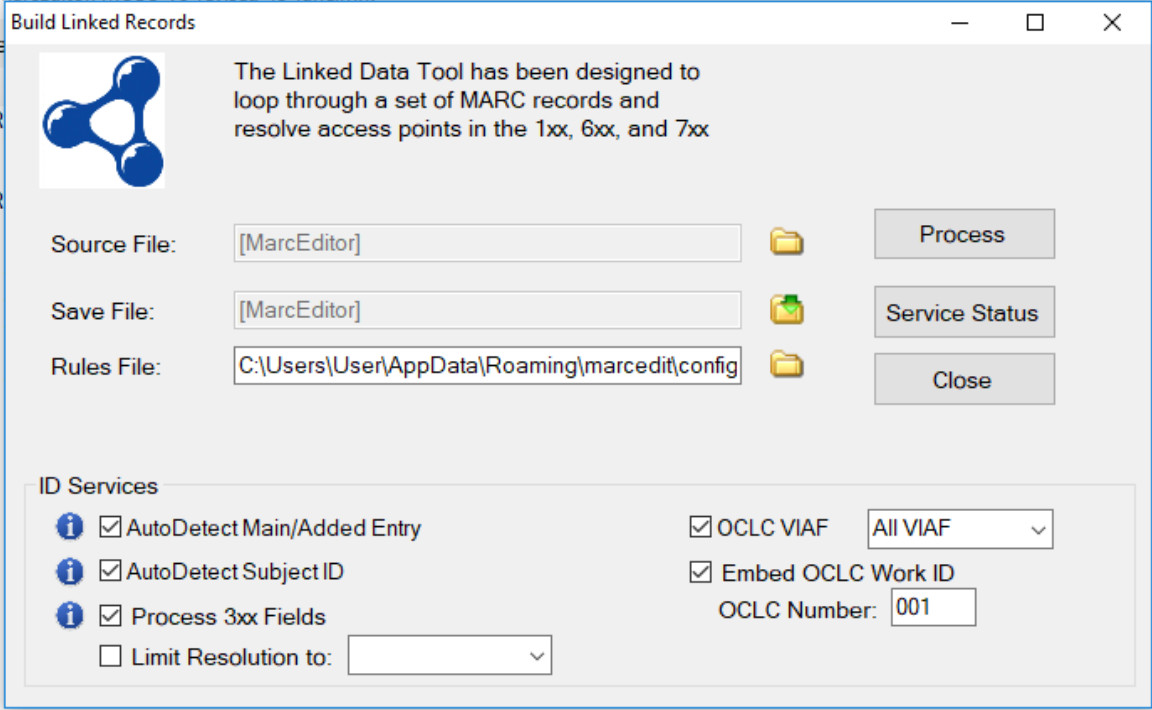




# Tools

## Linking Services and Validation:


- Build Linked Records using MarcEdit





MarcEditor: MODS\_V8\_revised\_13\_june.mrk

Build Linked Records

The Linked Data Tool has been designed to loop through a set of MARC records and resolve access points in the 1xx, 6xx, and 7xx

Source File: [MarcEditor] 

Save File: [MarcEditor] 

Rules File: C:\Users\User\AppData\Roaming\marcedit\config 

ID Services

- AutoDetect Main/Added Entry
- AutoDetect Subject ID
- Process 3xx Fields
- Limit Resolution to:
- OCLC VIAF
- Embed OCLC Work ID
- OCLC Number:

C:\Users\User\Desktop\MODS\_V8\_revised\_13\_june.mrk loaded in 0,027239 seconds.





# Key role changes?

- Subject specialists
- Metadata specialists
- Repository managers
- Systems Librarians
- Authors
- Publisher
- Etc.





# Key role changes?

- Subject specialists
- Metadata specialists
- Repository managers
- Systems Librarians
- Authors
- Publisher
- Etc.

Knowledge  
Engineers /  
Data Architects



# What is required?

- Mind shift from macro-bibliographic to micro-bibliographic
- Mind shift from micro-community to world-community
- Increased use and development of taxonomies and ontologies
- Increased understanding and use of underlying technologies
- Participate in and enable crowdsourcing



# References and Proposed Readings

- Amherst College Library. ACDC MODS Implementation Guidelines. Available: <https://www.amherst.edu/system/files/media/ACDCMODSGuidelines.pdf>
- Berners-Lee, Tim. 2009. The next Web of open, linked data. Available: [https://www.youtube.com/watch?v=OM6XIIcm\\_qo](https://www.youtube.com/watch?v=OM6XIIcm_qo)
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# References and Proposed Readings

- Linked Data Community. Linked Data - Connect Distributed Data across the Web. Available: <http://linkeddata.org/>
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- Van Hooland, S & Verborgh, R. 2014. Linked Data for Libraries, Archives and Museums: How to clean, link and publish your metadata. Facet Publishing
- W3C. Home Page. Available: <https://www.w3.org/>



Thank you!

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