

SWIB 2013 – Hamburg – 26<sup>th</sup> November 2013

# Linked Data for Libraries: Great Progress but what is the benefit?

Richard Wallis  
Technology Evangelist

OCLC

@rjw 

## The OCLC cooperative: a nonprofit, membership organization

**Further access to the world's information**

**Reduce the rate of rise of library costs**

**72,035 libraries in  
170 countries**

**OCLC serves libraries**

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



Bibliographic  
information in  
WorldCat



Licensed digital  
content/articles in  
library collections



Digitized  
local library content

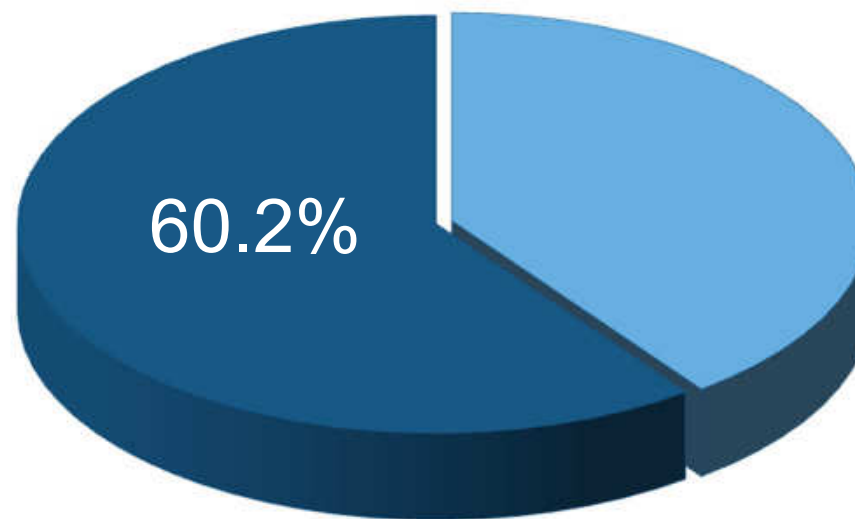
**300+ million**  
bibliographic records  
**2+ billion** holdings

**980million** records

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

<b>Total Records</b>	274 m
English	108.6 m
German	36.5 m
French	25.5 m
Spanish	11.3 m
Japanese	8.0 m
Chinese	6.5 m
Italian	4.7 m
Dutch	4.3 m
Russian	3.6 m
Latin	3.5 m

## Percentage of records for non-English materials



30 June 2012

SWIB 2013 – Hamburg – 26<sup>th</sup> November 2013

# Linked Data for Libraries: Great Progress but what is the benefit?

*For library users*

Richard Wallis  
Technology Evangelist

OCLC

@rjw 



# Library Linked Data

on the Web  
Yes

A Web of Data?  
Not quite yet...

... but things are happening



Google Search

gunter grass

berlin university of the arts

# Knowledge Graph

Web Images Maps Shopping More Search tools

About 44,200,000 results (0.41 seconds)

**The Berlin University of the Arts | Home - Universität der Künste Berlin**  
[www.udk-berlin.de/sites/content/topics/home](http://www.udk-berlin.de/sites/content/topics/home)  
 Encompasses practically all disciplines of the arts including fine arts, visual arts, design, architecture, music and the performing arts.  
 Study Courses - University - Experimental Media Design ... - Summer courses

**Berlin University of the Arts - Universität der Künste Berlin**  
[www.udk-berlin.de/sites/content/topics/university/](http://www.udk-berlin.de/sites/content/topics/university/)  
 The quintessence of Berlin University of the Arts is training in the arts.

**UdK Berlin | Berlin Summer University of the Arts**  
[www.udk-berlin.de/summer-courses](http://www.udk-berlin.de/summer-courses)  
 Berlin Summer University of the Arts - July 15th - October 13th 2013

**Berlin University of the Arts**  
[www.udk-berlin.de/](http://www.udk-berlin.de/) - Translate this page  
 Die Hochschule ist mit über 4600 Studierenden die größte Hochschule in Berlin und bietet einen Überblick zu den Studienangeboten.  
 4.3 ★★★★★ 6 Google reviews - Write review

Einsteinufer 43-10587 Berlin, Germany

**Berlin University of the Arts - Wikipedia, the free encyclopedia**  
[https://en.wikipedia.org/wiki/Berlin\\_University\\_of\\_the\\_Arts](https://en.wikipedia.org/wiki/Berlin_University_of_the_Arts)  
 The Universität der Künste Berlin, UdK (Berlin University of the Arts) is a public art school in Berlin, Germany, one of the four universities in the city.  
 History - Exchange Program - Notable alumni - Notable teachers

**Berlin University of the Arts | Art & Education**  
[www.artandeducation.net/client/berlin\\_university\\_of\\_the\\_arts/](http://www.artandeducation.net/client/berlin_university_of_the_arts/)  
 Berlin University of the Arts is one of the biggest, most diversified and traditional universities of the arts world-wide. The teaching offered at the four colleges of ...

**Berlin Summer University of the Arts - Berlin, Germany - College ...**  
<https://www.facebook.com/UDKsummercourses>  
 Berlin Summer University of the Arts, Berlin, Germany. 477 likes · 14 talking about this · 1

**Berlin University of the Arts**  
 The Universität der Künste Berlin, UdK is a public art school in Berlin, Germany, one of the four universities in the city. A Hochschule until November 2001, the university is one of the largest institutions of music and arts in the world. Wikipedia

**Address:** Einsteinufer 43-53, 10587 Berlin, Germany  
**Phone:** +49 30 31850  
**Enrollment:** 3,690 (2011)  
**Founded:** 1696

**People also search for**

Technical University of Berlin  
 Free University of Berlin  
 Humboldt University of Berlin  
 HTW Berlin - University of Applied Sciences  
 Folkwang University of the Arts

Feedback / More info

www.imdb.com/name/nm0335848/  
 Günter Grass, Writer: The Tin Drum. ... Unkenruf  
 Günter Grass (2007) · Die Rättin (1997) · Show all

von Goethe

Gradwork 2002  
 Cat and Mouse 1991  
 Dog Years 1995

My Century

Things NOT STRINGS



# An issue for libraries?

## Where are our users?

The image is a collage of overlapping screenshots from university library websites, primarily showing search results for 'chemistry'. The background is a solid blue with a faint, stylized white cloud graphic on the right side.

The most prominent screenshot is from the University of Leeds, showing a search for 'chemistry' with 1553 results. It includes a 'Refine This Search' sidebar with filters for Library Location (Kedleston Road, Devonshire Library (Buxton), Britannia Mill), Collection (Main Catalogue, eBooks, Journals Catalogue), Format (Book, eBook, Electronic resource, Serial, Periodical), and Subject (Chemistry, Environmental chemistry, Chemistry, Organic, Chemistry Problems, exercises, etc., Chemistry, Inorganic, Chemistry, Physical and theoretical, Chemistry, Analytic, Heterocyclic chemistry). The main results list includes 'A dictionary of chemistry' by Oxford University Press (2008, 6th ed.) and 'Chemistry' by Fullick, Ann (1956-).

Other visible screenshots include the University of Derby library website, showing a search for 'chemistry' with 1553 results, and a screenshot from a library website showing search results for 'chemistry' with 34,538 results, sorted by relevance. This screenshot also shows a 'Group results by entries for a work' section for 'Chemistry: structure and dynamics' by James N. Spencer and George M. Bodner, Lyman H. Rickard, published in 1941-1999.

The collage illustrates the complexity of library catalogues and the challenges of finding relevant resources for users.



# Where our users are!





- First, changes in general use, since people can now find BnF's resources directly on the Web.
- Mailing address: lots of mail, « new publics »
- Use statistic: 80%+ users from search engines
- R and D: Improvements to integrate in main catalogues and archives

Romain Wenz BnF



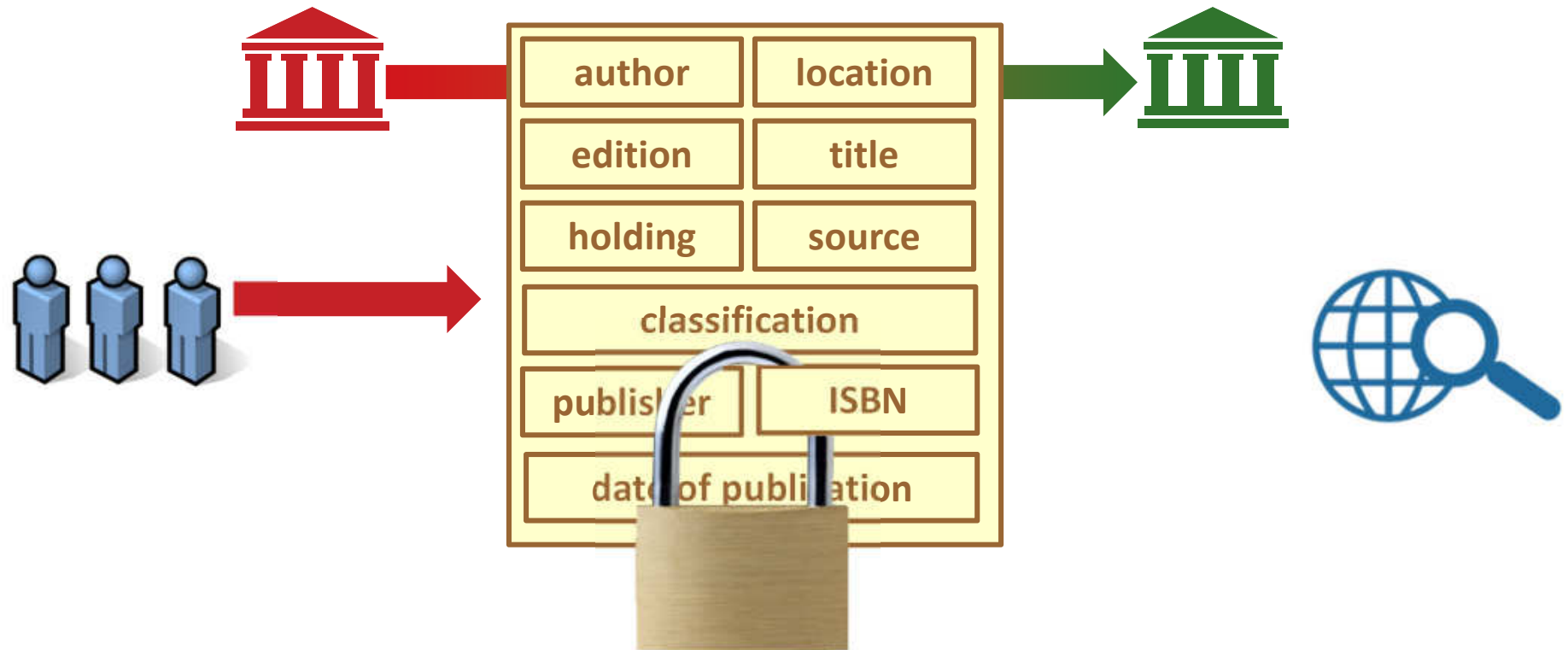
# The problem with access to library collections:

**People aren't using the library catalog?**

(No... that's just a fact.)

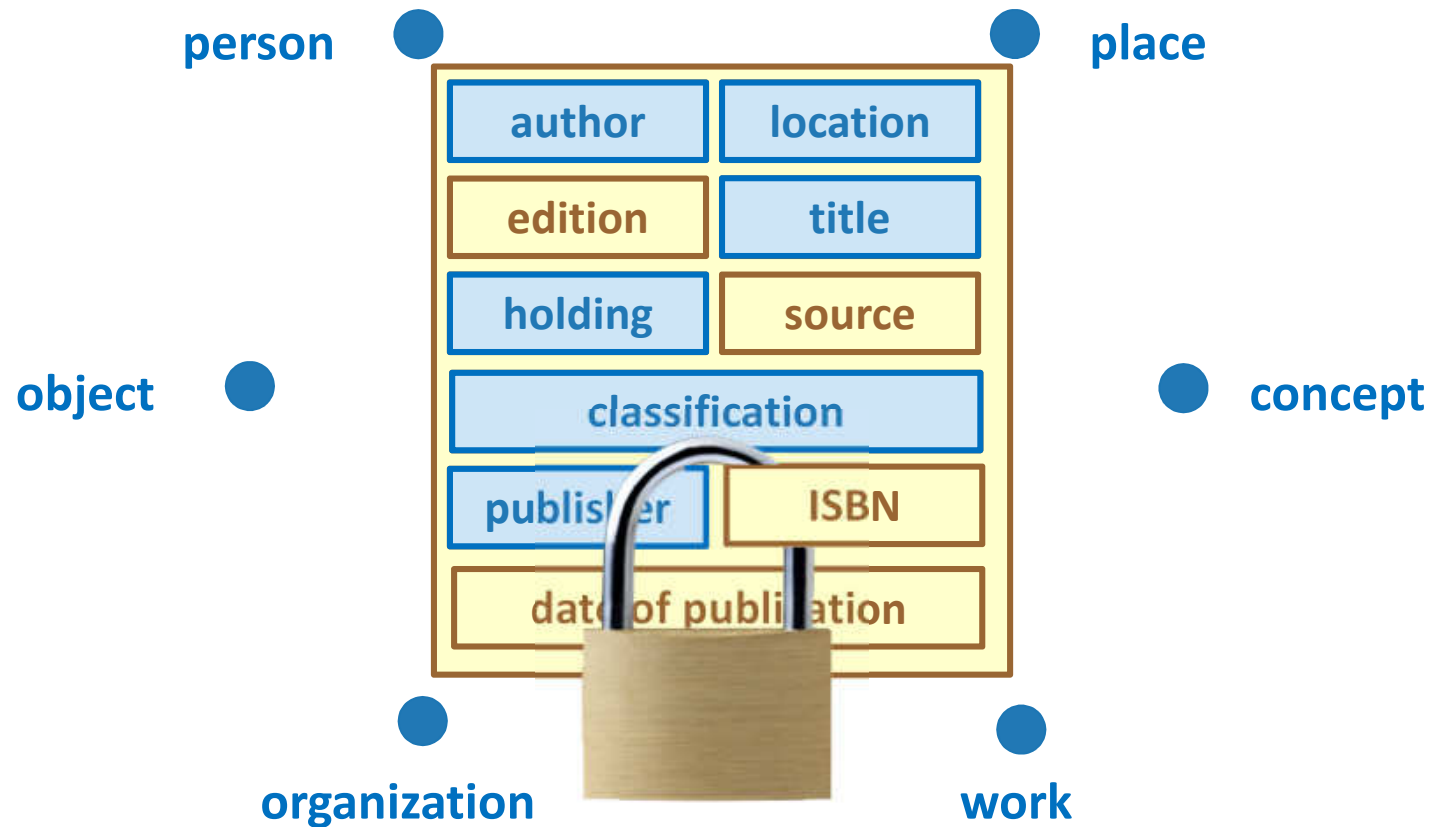
**The *real* problem is that we don't expose our collections very well on the web.**

library data:  
**stored as records**

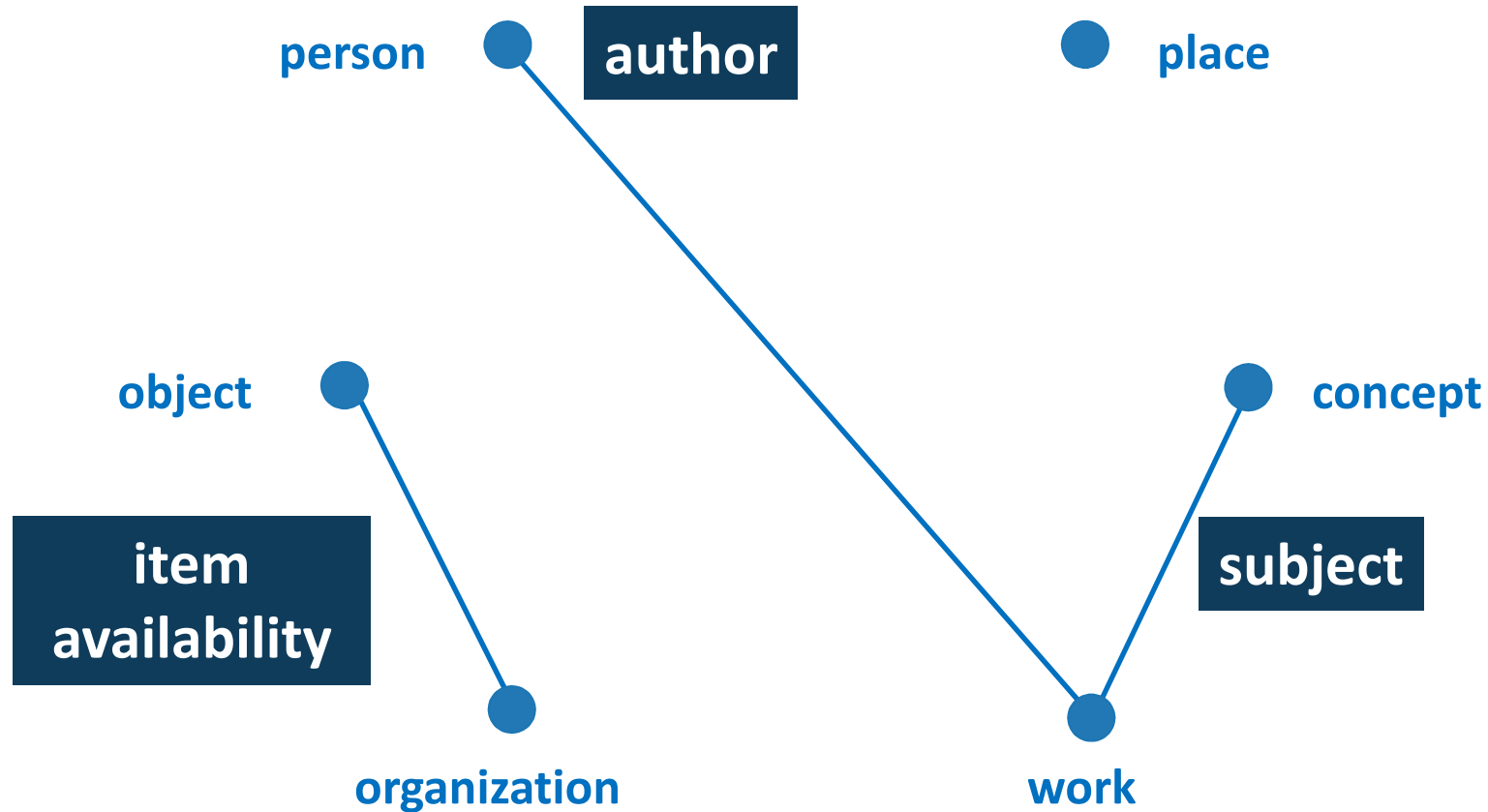




library data:  
**stored as records**



# library data stored as entities

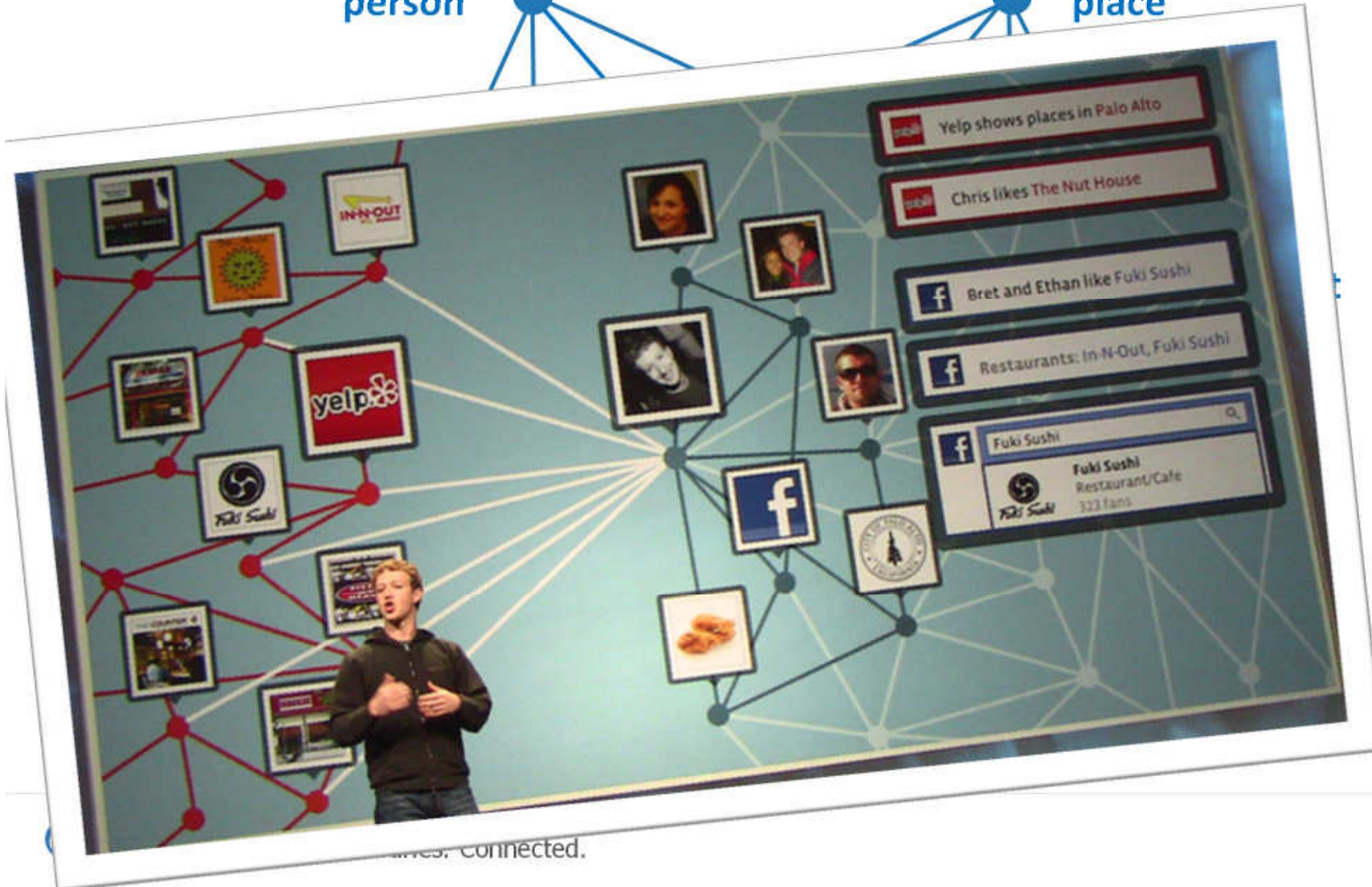


# library data stored as entities

## library knowledge graph

person

place



# Knowledge cards for libraries

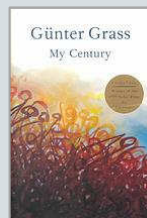
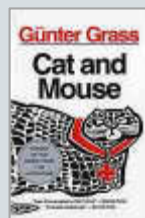
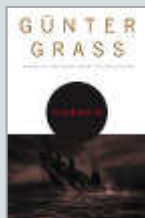
## Günter Grass



**Born: 16 October 1927**  
**Gdańsk, Poland**

German novelist, poet,  
playwright, illustrator,  
graphic artist, sculptor and  
recipient of the 1999 Nobel  
Prize in Literature.

### Works



### Subjects

[Germany](#) | [German literature](#) | [Historical fiction](#)  
[War stories](#) | [Black humor](#) | [Fantasy](#)

### Quotes

“Even bad books are books and therefore sacred.”—  
*The Tin Drum*

**Find Günter Grass works at:**

[Libraries near me](#) | [Online Retailers](#)

# Google Knowledge Graph



## Günter Grass

Novelist

Günter Wilhelm Grass is a German novelist, poet, playwright, illustrator, graphic artist, sculptor and recipient of the 1999 Nobel Prize in Literature. He is widely regarded as Germany's most famous living writer. [Wikipedia](#)

**Born:** October 16, 1927 (age 85), Wrzeszcz, Gdańsk, Poland

**Parents:** [Helene Knoff](#)

**Movies:** [The Call of the Toad](#), [Cat and Mouse](#)

**Education:** [Kunstakademie Düsseldorf](#), [Berlin University of the Arts](#)

**Awards:** Nobel Prize in Literature, Prince of Asturias Award for Letters

### Books



**The Tin Drum**  
1959



**Crabwalk**  
2002



**Cat and Mouse**  
1961



**Dog Years**  
1965



**My Century**




Knowledge cards for libraries

Library data stored as entities

## the library knowledge graph

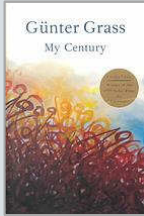
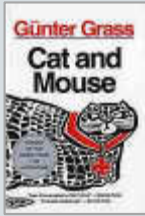
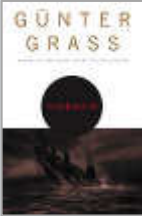

### Günter Grass



**Born: 16 October 1927**  
**Gdańsk, Poland**

German novelist, poet, playwright, illustrator, graphic artist, sculptor and recipient of the 1999 Nobel Prize in Literature.

#### Works



#### Subjects

[Germany](#) | [German literature](#) | [Historical fiction](#)  
[War stories](#) | [Black humor](#) | [Fantasy](#)

#### Quotes

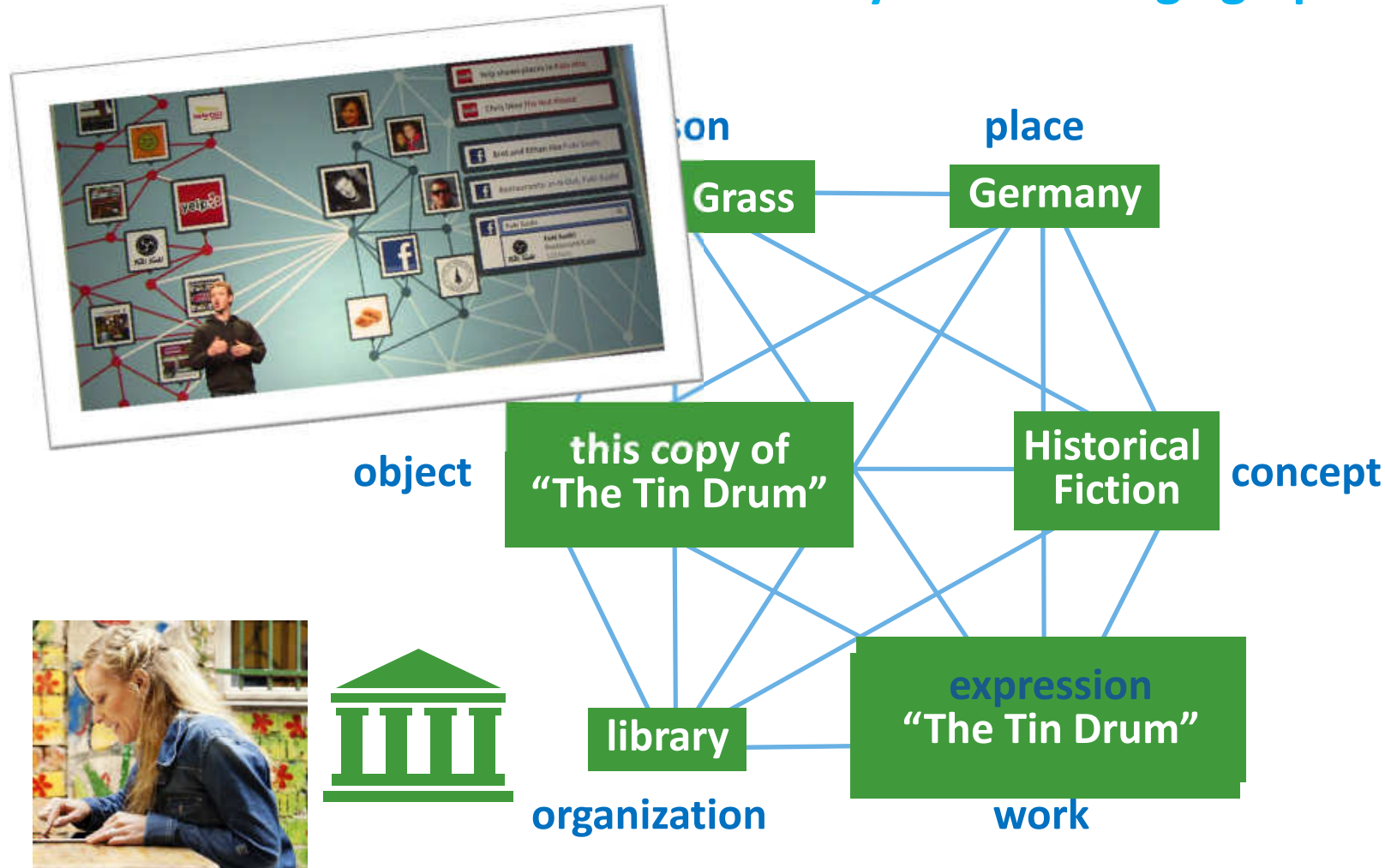
“Even bad books are books and therefore sacred.”—  
*The Tin Drum*

**Find Günter Grass works at:**  
[Libraries near me](#) | [Online Retailers](#)

- Library content
- Web content
- Links out to e-commerce

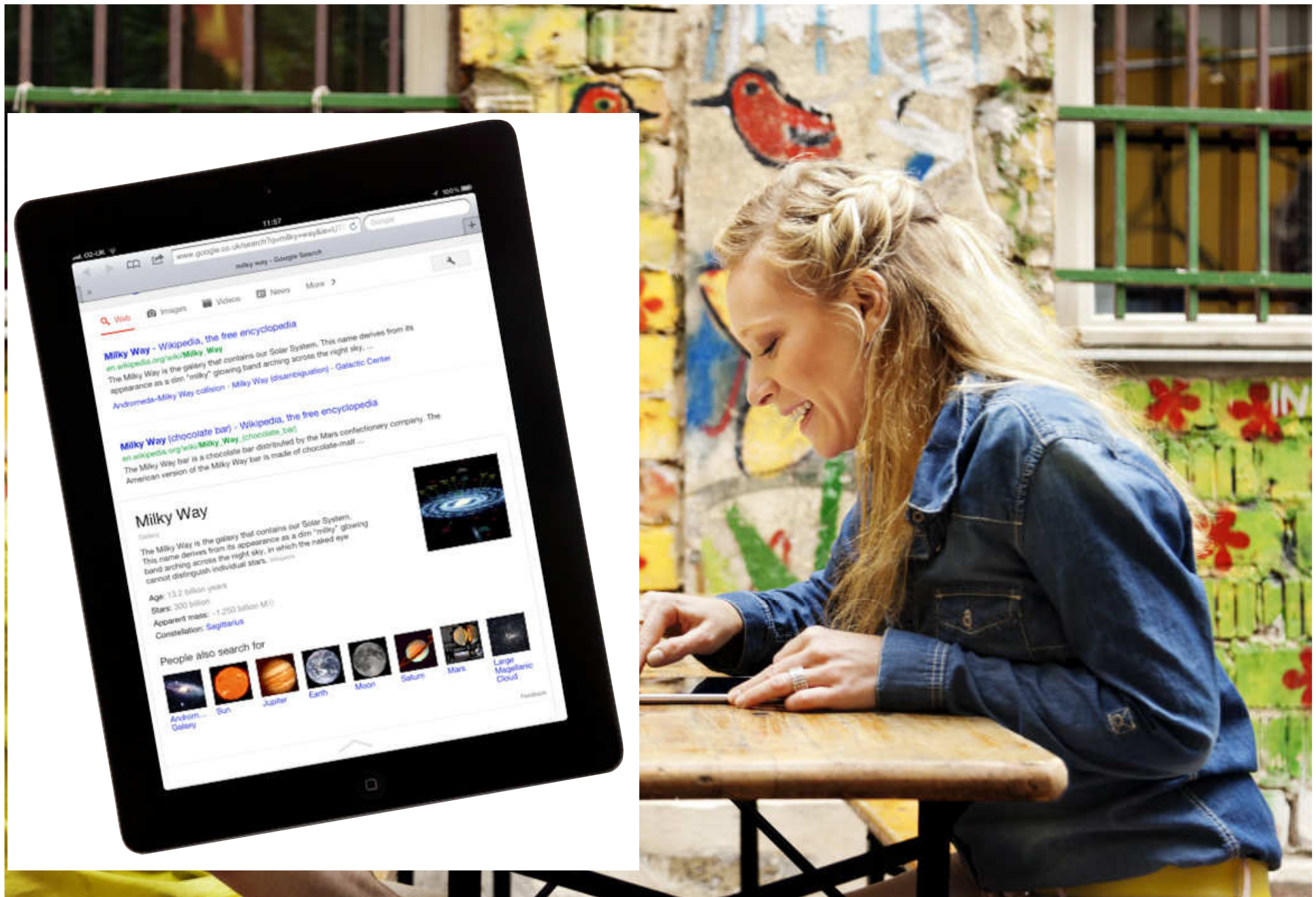
# library data stored as entities

Field in a record vs. entity in knowledge graph



We are moving from  
cataloguing  
to

**http://catalinking**







gunter grass



SIGN IN

Web Images Maps Shopping More Search tools



About 660,000 results (0.47 seconds)

**Günter Grass - Wikipedia, the free encyclopedia**

[en.wikipedia.org/wiki/Günter\\_Grass](http://en.wikipedia.org/wiki/Günter_Grass)

Günter Wilhelm Grass is a German novelist, poet, playwright, illustrator, graphic artist, sculptor and recipient of the 1999 Nobel Prize in Literature. He is widely ...

The Tin Drum - Luftwaffenhelfer - Category:Novels by Günter ...

**Günter Grass | Books | The Guardian**

[www.theguardian.com](http://www.theguardian.com) > Culture > Books

15+ items - Latest news and comment on Günter Grass from the Guardian.

Herta Müller: a life in books.

30 Nov 2012

Günter Grass poem praises nuclear whistleblower Mordechai ...

1 Oct 2012

**Günter Grass News - The New York Times**

[topics.nytimes.com/top/reference/timestopics/.../gunter\\_grass/index.html](http://topics.nytimes.com/top/reference/timestopics/.../gunter_grass/index.html)

News about Günter Grass. Commentary and archival information about Günter Grass from The New York Times.

**Amazon.com: Günter Grass: Books, Biography, Blog, Audiobooks ...**

[www.amazon.com/Gunter-Grass/e/B000AP9IZ8](http://www.amazon.com/Gunter-Grass/e/B000AP9IZ8)

Results 1 - 12 of 118 - Born in Danzig, Germany, in 1927, Günter Grass is a widely acclaimed author of plays, essays, poems, and numerous novels. He was ...

**Gunter Grass (German writer) - Encyclopedia Britannica**

[www.britannica.com/EBchecked/topic/242123/Gunter-Grass](http://www.britannica.com/EBchecked/topic/242123/Gunter-Grass)

German poet, novelist, playwright, sculptor, and printmaker who, with his extraordinary first novel Die Blechtrommel (1959; The Tin Drum), became the literary ...

**Books by Günter Grass (Author of The Tin Drum) - Goodreads**

[www.goodreads.com/author/list/749461.G\\_nter\\_Grass](http://www.goodreads.com/author/list/749461.G_nter_Grass)

Günter Grass has 148 books on Goodreads with 44346 ratings. Günter Grass's most popular book is Lebenslang: Ausgewählte Gedichte.

**Günter Grass - IMDb**

[www.imdb.com/name/nm0335848/](http://www.imdb.com/name/nm0335848/)

Günter Grass, Writer: The Tin Drum. ... Unkenrufe (2005) · Der Unbequeme - Der Dichter Günter Grass (2007) · Die Rättin (1997) · Show all · Hide all | Show by:..



More images

## Günter Grass

Novelist

Günter Wilhelm Grass is a German novelist, poet, playwright, illustrator, graphic artist, sculptor and recipient of the 1999 Nobel Prize in Literature. He is widely regarded as Germany's most famous living writer. [Wikipedia](#)

**Born:** October 16, 1927 (age 85), Wrzeszcz, Gdańsk, Poland

**Parents:** Helene Knoff

**Movies:** The Call of the Toad, Cat and Mouse

**Education:** Berlin University of the Arts, Kunstakademie Düsseldorf

**Awards:** Nobel Prize in Literature, Prince of Asturias Award for Letters

### Books



The Tin Drum  
1959



Crabwalk  
2002



Cat and Mouse  
1961



Dog Years  
1965



My Century

People also search for



OCLC The world's libraries. Connected.

Tell them about our resources...  
...using their language and methods



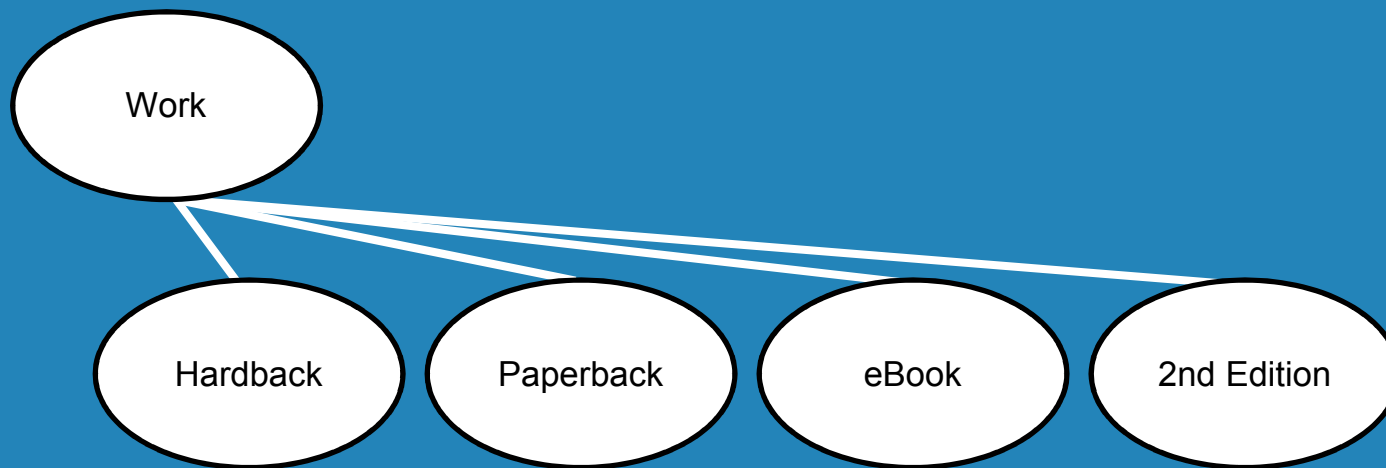


## Linked Data

- 300+ million data resources
- Schema.org
- Embedded RDFa
- Links to Dewey, LCSH, LCNAF, DOI, VIAF, FAST
- ODC-BY license
- June 2012
- Continuing development:
  - Vocabulary, Content-negotiation, Links, Works, ...

# OCLC Heads-up

## Mixed Data



Example:

[<http://www.worldcat.org/entity/work/id/31233333>](http://www.worldcat.org/entity/work/id/31233333)



# OCLC Heads-up

## Works Linked Data

<<http://www.worldcat.org/entity/work/id/31233333>

>

```
<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
  <http://www.worldcat.org/core/work/id/31233333> a <http://purl.org/vocab/frbr/core#Work>,
    schema:CreativeWork;
  dc:isPartOf [ a <http://purl.org/ontology/bibo/Series>;
    schema:name "Occasional paper (Hong Kong Institute of Asia-Pacific Studies) "; ] ;
  schema:about [ a schema:Intangible;
    schema:name "Political parties -- Public opinion. -- Hong Kong" ],
    [ a schema:Intangible;
    schema:name "Hong Kong (China) -- Politics and government." ];
  schema:author [ a schema:Person;
    schema:name "Liu, Zhaojia." ];
  schema:description "";
  schema:inLanguage "eng";
  schema:name "Public attitude toward political parties in Hong Kong";
  skos:narrower <http://www.worldcat.org/oclc/29556612>,
    <http://www.worldcat.org/oclc/647245064>,
    <http://www.worldcat.org/oclc/654783642> .
```

```
</schema:about>
```

```
<schema:about xmlns:schema="http://schema.org/">
```

```
<rdf:Description>
```

```
<rdf:type rdf:resource="http://schema.org/Intangible" />
```

# OCLC Heads-up

## Works Linked Data

<<http://www.worldcat.org/entity/work/id/31233333>>

Current project state:

- Experimental pre-release
- Only RDF/XML
- Vocabulary changes coming
- No lookup service yet



## Linked Data

- 300+ million data resources
- Schema.org
- Embedded RDFa
- Links to Dewey, LCSH, LCNAF, DOI, VIAF, FAST
- ODC-BY license
- June 2012
- Continuing development:
  - Vocabulary, Content-negotiation, Links, Works, ...

World War I (Book, 2003) [WorldCat.org]

World War I (Book, 2003) [WorldCat.org]

www.worldcat.org/title/world-war-i/oclc/52541937?referer=brief\_results

Most Visited WorldCat.org: Th... RDFa 1.1 Distille... Linked data at O... Dev: Linked Dat... WorldCat on Fac... Bookmarks

### Linked Data

More info about Linked Data

[library:oclcnum](#) "52541937"

[library:placeOfPublication](#) [rdf:type](#) [schema:Place](#)

[rdf:type](#) [schema:name](#) "New York :"

[schema:about](#) [schema:name](#) "World War (1

[schema:about](#) [skos:inScheme](#) <<http://dewey.info/class/940/e22/about>

[schema:about](#) [rdf:type](#) [skos:Concept](#)

[schema:about](#) [skos:inScheme](#) <<http://dewey.info/class/940/e22/about>

[schema:about](#) [madsrdf:isIdentifiedByAuthority](#)

[schema:about](#) [rdf:type](#)

[schema:name](#) "World War, 1914-1918"

Book - schema.org

World War I (Book, 2003) [WorldCat.org] Book - schema.org

schema.org/Book

Dewey Decimal Classification: 940

World War I (Book, 2003) [WorldCat.org] Dewey Decimal Classification: 940

dewey.info/class/940/e22/about

World War, 1914-1918 - LC Linked Data Service (Library of Congress)

World War I (Book, 2003) [WorldCat.org] World War, 1914-1918 - LC Linked Data Service (Library of Congress)

id.loc.gov/authorities/subjects/sh85148236.html

LIBRARY OF CONGRESS

ASK A LIBRARIAN DIGITAL COLLECTIONS LIBRARY CATALOGS Search Search Loc.gov GO

The Library of Congress > Linked Data Service > LC Subject Headings

### World War, 1914-1918

From [Library of Congress Subject Headings](#)

Details Visualization Suggest Terminology

#### World War, 1914-1918

URI(s)

- <http://id.loc.gov/authorities/subjects/sh85148236>
- <http://info.loc.gov/authorities/sh85148236>
- <http://id.loc.gov/authorities/sh85148236#concept>

Instance Of

- [MADS/RDF Topic](#)
- [MADS/RDF Authority](#)
- [SKOS Concept](#)

Scheme Membership(s)

- [Library of Congress Subject Headings](#)

Collection Membership(s)

- [LCSH Collection - Authorized Headings](#)
- [LCSH Collection - General Collection](#)
- [LCSH Collection - Term Permitted to be Indirectly Subdivided Geographically](#)

Variants

Find: Next Previous Highlight all Match case



# Part of the Web of Data

Nawal El Saadawi – Wikidata

www.wikidata.org/wiki/Q238514

Reader

Wikipedia pages linked to this item (19 entries)

Language	Code	Linked article	
العربية	arwiki	نوال السعداوي	[edit]
مصرى	arwiki	نوال السعداوي	[edit]
català	cawiki	Nawal al-Sa'dawi	[edit]
Deutsch	dewiki	Nawal El Saadawi	[edit]
English	enwiki	Nawal El Saadawi	[edit]
español	eswiki	Nawal al-Sa'dawi	[edit]
فارسی	fawiki	نوال سعداوي	[edit]
suomi	fiwiki	Nawal El Saadawi	[edit]
français	frwiki	Nawal el Saadawi	[edit]
galego	glwiki	Nawal el Saadawi	[edit]
עברית	hewiki	נוואל א-סעדאוי	[edit]
italiano	itwiki	Nawal al-Sa'dawi	[edit]
Nederlands	nlwiki	Nawal el Saadawi	[edit]
norsk bokmål	nowiki	Nawal El Saadawi	[edit]
português	ptwiki	Nawal al-Sa'dawi	[edit]
Scots	scowiki	Nawal El Saadawi	[edit]
svenska	svwiki	Nawal El Saadawi	[edit]
Türkçe	trwiki	Nevâi es-Saadavi	[edit]
中文	zhwiki	纳瓦勒·萨达维	[edit]


# Part of the Web of Data

The hidden face of Eve : women in the Arab world (Book, 2007) [WorldCat.org]

www.worldcat.org/title/hidden-face-of-eve-women-in-the-arab-world/oclc/81453459

Home Search

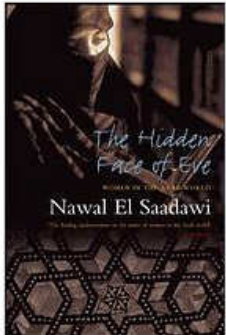
Create lists, bibliographies and reviews: [Sign in](#) or [create a free account](#)

  Search

[Advanced Search](#) [Find a Library](#)


[Cite/Export](#) [Print](#) [E-mail](#) [Share](#) [Permalink](#)

[Add to list](#) [Add tags](#) [Write a review](#) Rate this item: ☆☆☆☆☆

 **The hidden face of Eve : women in the Arab world**

Author: [Nawāl Sa'dāwī](#)

Publisher: London ; New York : Zed Books ; New York, NY : Distributed in the USA exclusively by Palgrave Macmillan, 2007.

Edition/Format:  Book : Biography : English : New ed [View all editions and formats](#)

Database: WorldCat

Summary: "This powerful account of the oppression of women in much of the Arab world remains as shocking today as when it was first published, more than a quarter of a century ago. Nawal El Saadawi writes out of a powerful sense of the violence and injustice which permeated her society. Her experiences working as a doctor in villages around Egypt, witnessing prostitution, honour killings and sexual abuse, including female [Read more...](#)

Rating: ☆☆☆☆☆ (not yet rated) [0 with reviews - Be the first.](#)

Subjects: [Women -- Middle East.](#)  
[Arab World -- Middle East.](#)  
[Sexual Behavior -- Middle East.](#)  
[View all subjects](#)

More like this [Similar Items](#)

**Nearby libraries**

[Walker Street Customer Service Centre](#)  
Hull HU3 2RA, United Kingdom  
2m / 2.8km

[Western Library](#)  
Hull HU3 3ED, United Kingdom  
2m / 3.0km

[Kingston upon Hull Libraries](#)  
Hull HU1 3TF, United Kingdom

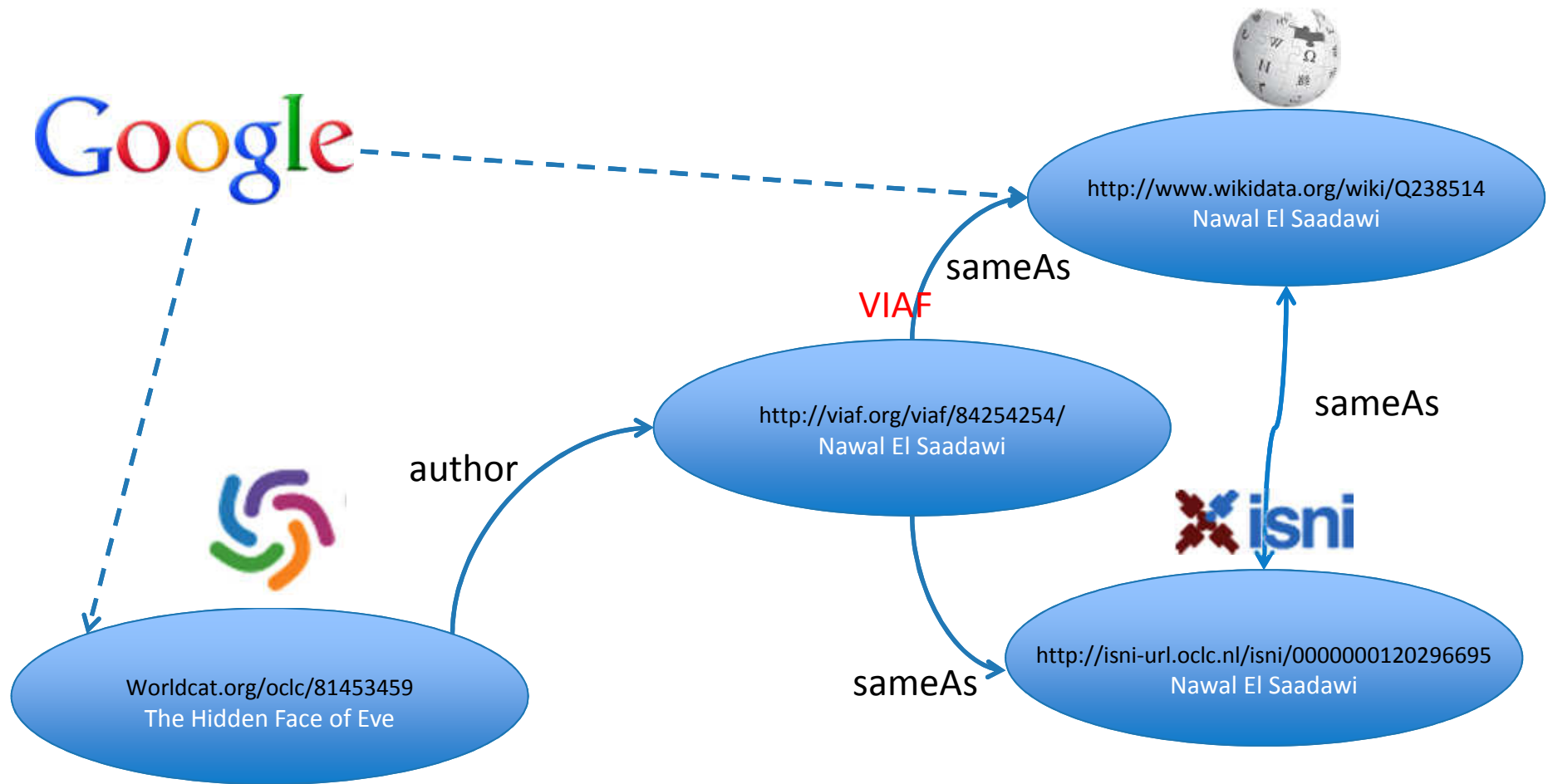
Librarian? [Claim your library](#)

[Borrow / obtain a copy](#) [Buy it](#)

**Find a copy in the library**

Enter your location: worcester, uk [Find libraries](#) or select a location: WR101 Worcester, GB

## Part of the Web of Data



## Thing > CreativeWork > Book

A book.

Google

bing™

YAHOO!

Yandex

url	URL
Properties from <b>CreativeWork</b>	
about	Thing
accountablePerson	Person
aggregateRating	Aggregat
alternativeHeadline	Text
associatedMedia	MediaObject
audio	AudioObject
author	Person or Organization
award	Text
awards	Text
comment	UserComments
contentLocation	Place
contentRating	Text
contributor	Person or Organization

scription of the item.

mage of the item.

the CreativeWork.

A secondary title of the C

The media objects that er

An embedded audio objec..

The author of this content. Please note that author is special in th  
indicating authorship via the rel tag. That is equivalent to this an

An award won by this person or for this creative work.

Awards won by this person or for this creative work. (legacy spell

Comments, typically from users, on this CreativeWork.

The location of the content.

Official rating of a piece of content—for example, 'MPAA PG-13'.

A secondary contributor to the CreativeWork.



is

schema.org

good enough ?

For library data exchange?

**No**

For sharing library resources with the web?

**Almost**

[Mailing List](#)[Wiki](#)[Chat](#)[RSS](#)[Contact Group](#)[Community & Business Groups](#) → [Schema Bib Extend Community Group](#)

## Schema Bib Extend Community Group

The mission of this group is to discuss and prepare proposal(s) for extending Schema.org schemas for the improved representation of bibliographic information markup and sharing. The group will seek consensus around, and support for, proposal(s) to the W3C WebSchemas Group. This Community Group will not, itself, produce technical specifications.

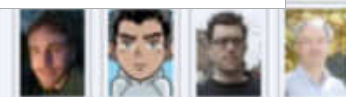
### Get involved!

Anyone may join this Community Group. All participants in this group have signed the W3C Community Contributor License Agreement (CLA).

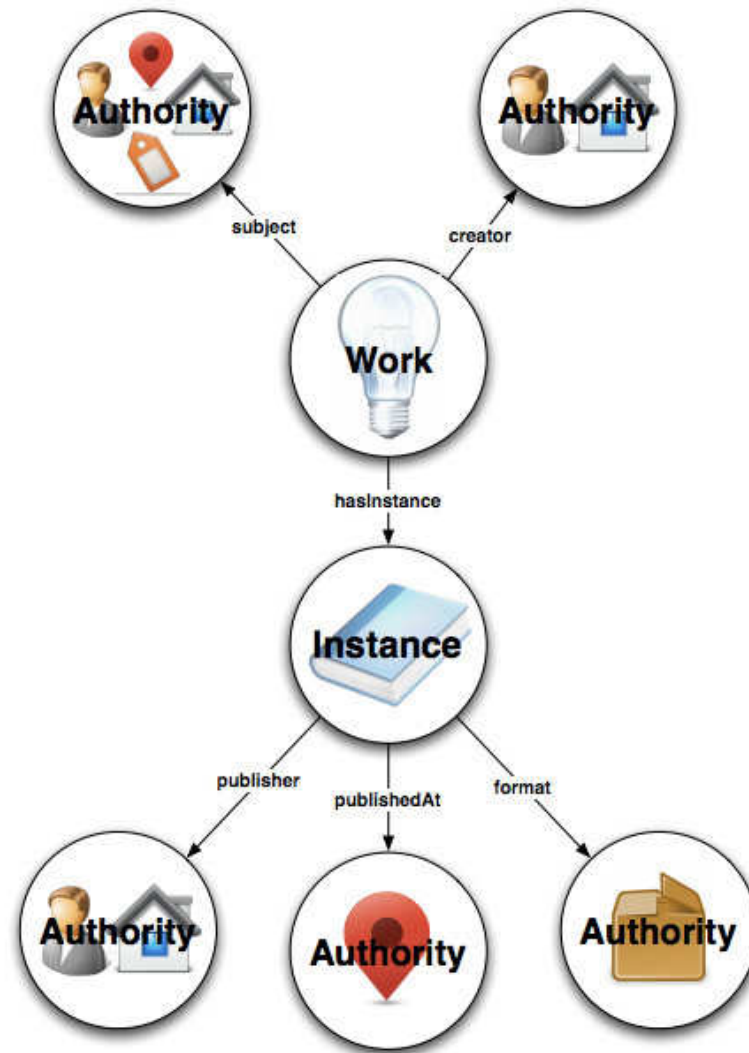
[JOIN THIS GROUP](#)

<http://www.w3.org/community/schemabibex>

- Short lived group
- Libraries, Publishers, Consumers, System Vendors, Linked Data, Standards Bodies
- Library is only one focus

[October Meeting](#)

# BIBFRAME



<http://www.bibframe.org>

schema.org

≈ Complementary ≈



**bibliographic description as part of the web**



<http://www.flickr.com/photos/54136840@N00/4921290518/>



# Be Visible on the Web of Data

Lighting the way to your resources ...

.... registered in the network

<http://wallpapersfor.me/storm-beacon/>



*Different*

# A Future Role for Discovery Interfaces?

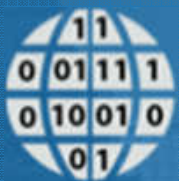
*When part of the Web of Data*

- Destinations for external discovery
- Linked Data publishing hubs
- Specialized local discovery



# Building a Web of Data





# Building a Web of Data

Linking to all  
and

all their resources

**We all need to participate**



# Happening in a hurry?

The web tries to  
keep up with the  
progress of  
technology  
together







SWIB 2013 – Hamburg – 26<sup>th</sup> November 2013

# Linked Data for Libraries: Great Progress but what ~~is~~ the benefit? *will be*

Richard Wallis  
Technology Evangelist

OCLC  
@rjw 