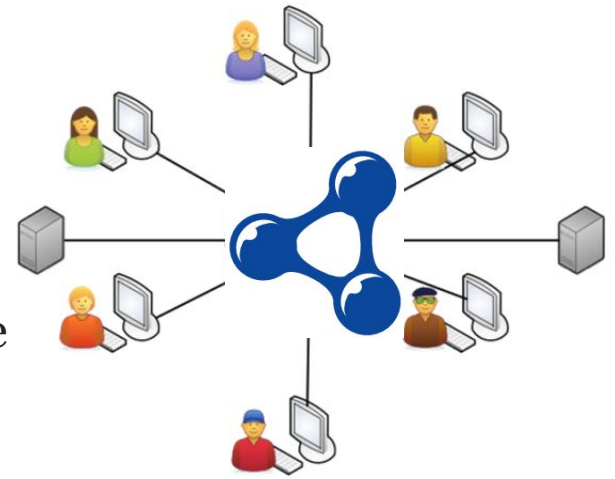


# “Connecting the Nodes”

An update from the National Library of Sweden (KB)

# Libris in brief

- ❑ Libris is the centralized Swedish union catalogue
- ❑ Edited by all Libraries in the Libris cooperation.
- ❑ Records exported to each local library system.



## Libris XL: Linked data infrastructure based on Bibframe since June 2018

- Core system Database/Index/Conversions + Pipelines for Import/Export
- Libris Cataloging tool
- [id.kb.se](http://id.kb.se) / Vocabulary, terms and linked data service

# Libris XL

## ...from project to operational process

Libris XL project ended September 2020, then...

...refitting of our methods and development process.

... still work from home, “new” team, broader scope.

... reorganization of KB.

# Incremental improvements

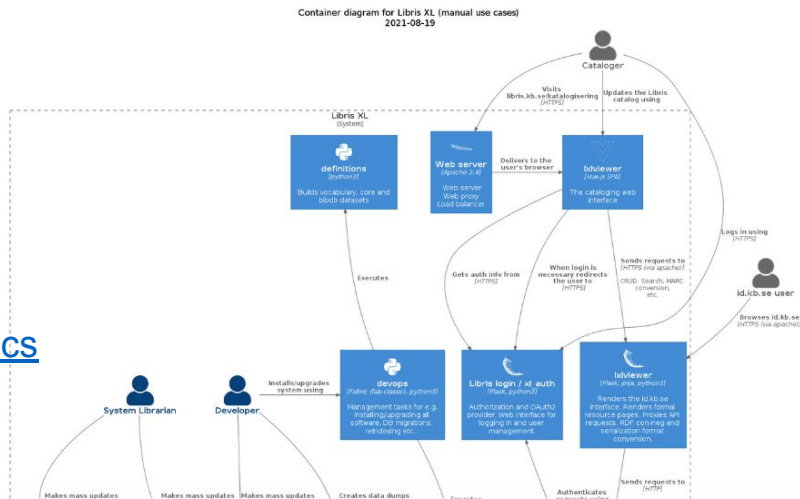
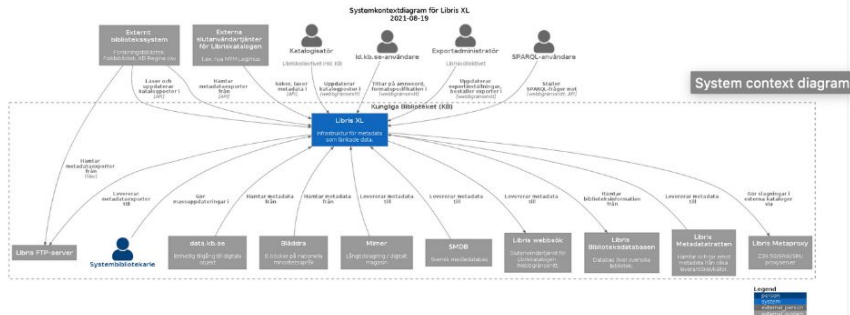
Less frequent release schedule (4 per year)

- Stabilization of the system and infrastructure (Quality of life)
- Scripted data cleanups and normalization (Works)
- Keeping up to date with Bibframe Vocabulary and conversions.
- Data validation (structural).
- Documentation of the System, API, etc.

## Architecture diagrams

System context diagram, container diagram and deployment diagram using the C4 model.

The container diagram has been split in two parts. Source files can be found [here](#).



<https://github.com/libris/xl-docs>

# https://libris.kb.se/sparql

The screenshot shows the Libris SPARQL Query Editor interface. At the top, the browser address bar displays "https://libris.kb.se/sparql". The page title is "Libris SPARQL Query Editor" with navigation links for "About" and "Tables". On the right, there are links for "Sample queries (Swedish)" and "Permalink", along with user information: "Extensions: cxml save to dav sponge User: SPARQL".

The main section is titled "Default Data Set Name (Graph IRI)" and contains an empty text input field. Below this is the "Query Text" section, which contains a SPARQL query:

```
SELECT COUNT(DISTINCT ?novel) AS ?count {  
  ?novel bf2:instanceOf/bf2:genreForm/(owl:sameAs|skos:exactMatch)* marc:Novel ;  
  kbv:publication/kbv:year "2021"  
}
```

Below the query text is the "Results Format" dropdown menu, currently set to "HTML". There are two buttons: "Execute Query" (highlighted in blue) and "Reset".

The "Execution timeout" section shows a value of "0" with a unit selector set to "milliseconds".

The "Options" section includes three checkboxes:

- Strict checking of void variables
- Log debug info at the end of output (has no effect on some queries and output formats)
- Generate SPARQL compilation report (instead of executing the query)

At the bottom, the footer contains copyright information: "Copyright © 2021 OpenLink Software" and "Virtuoso version 07.20.3233 on Linux (x86\_64-pc-linux-gnu) Single Server Edition (62 GB total memory)".

# Linking library agents/collections

The screenshot displays a library catalog interface with the following components:

- Header:** Libris katalogisering 1.22.2, Instance \* (dropdown), Free text (dropdown), Search icon, and Help icon.
- Navigation:** LIBRIS (selected), OTHER SOURCES.
- Search Results:** Showing 1-20 of 12900233 hits. Sorting: Publication year (descending).
- Filter Panel (Left):**
  - FILTER:** HAS HOLDING (1F) (selected)
  - Uppsala universitetsbib... • U 1M
  - Umeå universitetsbiblio... • Q 1M
  - Göteborgs universitet... • G 994k
  - Stockholms universite... • H 920k
  - Stockholms univer... • Hdig 753k
  - Chalmers tekniska ... • Zdij 499k
  - Linköpings universi... • LiUd 479k
  - Uppsala universitet... • Udix 473k
  - Kungliga Tekniska ... • Tdig 463k
  - Umeå universitets... • Qdig 443k
  - Mittuniversitetet • ... • Miun 442k
  - Sveriges depåbibl... • Umdp 441k
  - Mälardalens högs... • Mdhd 430k
  - Högskolan i Borås ... • Hibd 418k
  - Luleå universitets... • LTUd 413k
  - Linköpings universitet... • Li 407k
  - Nationalbibliografin • NB 399k
  - Malmö universitet... • Maud 373k
  - Karlstads universit... • Kdig 369k
  - TYPE OF WORK (1F):**
    - Text 12M
    - Moving image 369k
    - Audio 164k
    - Notated music 139k
    - Still image 58k
  - Show more...
- Record Details (Main):**
  - Type:** Instance
  - B SOUND RECORDING, INSTANCE • MONOGRAPH, AUDIO, AUDIO DISC, SOUND DISC • D**
  - Title:** L'Art du psalterion, The art of the psaltery
  - Identifier:** Audio issue number ARN 60680, EAN 3325480606809
  - Instance of:** No linguistic content
  - Creative respon...:** Maurice Guys
  - Publication:** France • 2006 • Arion • ©2006
  - Extent:** 1 CD
  - Accompanied by:** {Instance without title entity}
- Record Details (Bottom):**
  - B UNSPECIFIED, INSTANCE • MONOGRAPH** (r5vkzgmfpdkd8td)
  - Title:** Dissertatio diaetetica de usu et abusu cerevisiae Lovaniensis, et de ejus inter alias praeroga...
  - Instance of:** Latin
  - Publication:** tryckort saknas • tryckare saknas • årtal saknas
  - Extent:** [15] s.
  - Dimensions:** 8:o
  - HOLDING:** + 1
- Record Details (Bottom):**
  - B PRINTED, INSTANCE • SERIAL, UNMEDIATED, VOLUME** (714h6n1g5s3l14wv)
  - Title:** Surteglimtar • AB Surte glasbruks personaltidning
  - Instance of:** Swedish
  - Publication:** Sweden • Surte • Surte glasbruk • Årg. 1(1946):nr 1-
  - Physical details ...:** illustrationer
- Inset Window (Right):** Carolinabiblioteket Uppsala universitetsbibliotek. Kontaktuppgifter: POSTADRESS, TELEFON, FAX, Öppettider, E-POST, WEBSITE.

# Linking Persons to wikidata\*

AGENT		ADMINMETADATA
AGENTTYP	Person	
EFTERNAMN	Klint	
FÖRNAMN	Hilma af	
FÖDELSETID OCH/ELLER DÖDSTID	1862-1944	
VARIANT	› Person: Af Klint • Hilma • 1862-1944	
BESKRIVNING	Konstnär	
IDENTIFIKATOR	› ISNI: 0000 0001 2320 0433	
NATIONALITET/VERKSAMHETS-LAND	<a href="#">Sverige</a>	
EXAKT MATCH	<a href="http://www.wikidata.org/entity/Q436267">http://www.wikidata.org/entity/Q436267</a>	
SAMMA SAK SOM	<a href="resource/auth/240103">resource/auth/240103</a>	

Wikidata page for Hilma af Klint (Q436267). The page displays the Wikidata logo, the item name, and a table of labels in various languages. The 'English' label is 'Hilma af Klint' and the 'Swedish' label is 'Hilma af Klint'. The 'Description' column shows 'svensk konstnär och teosof' and 'ruotsalainen taiteilija, antroposofi ja abstraktin taidon edistäjä'. The 'Also known as' column shows 'Hilma Af Klint' and 'Klint, Hilma af'. Below the table, there are sections for 'Statements' and 'Image'.

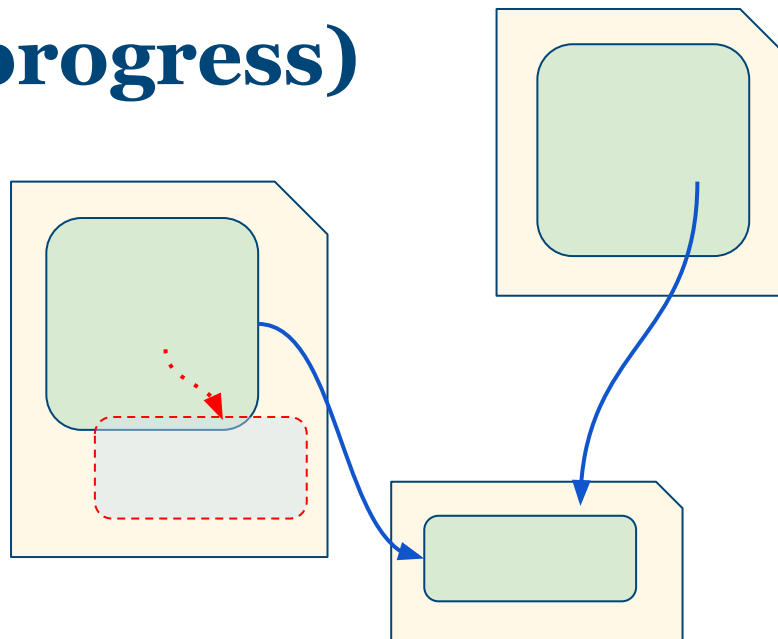
\* In the upcoming Libris 1.23 release.



# Work entities (in progress)

Linking:

- ❑ Enables Reuse
- ❑ Eliminates Redundancy
- ❑ Ensures Consistency



# Work clustering

Work Title clustering focus: Modern fiction in Swedish (incl. translations).

2220	Title: perelandra	Title: perelandra	Title: perelandra	Title: perelandra	Title: perelandra
translationOf	<a href="https://id.kb.se/language/eng">https://id.kb.se/language/eng</a>	<a href="https://id.kb.se/language/eng">https://id.kb.se/language/eng</a>	<a href="https://id.kb.se/language/eng">https://id.kb.se/language/eng</a>	<a href="https://id.kb.se/language/eng">https://id.kb.se/language/eng</a>	<a href="https://id.kb.se/language/eng">https://id.kb.se/language/eng</a>
@type	Text	Text	Text	Text	Text
language	<a href="https://id.kb.se/language/swe">https://id.kb.se/language/swe</a>	<a href="https://id.kb.se/language/swe">https://id.kb.se/language/swe</a>	<a href="https://id.kb.se/language/swe">https://id.kb.se/language/swe</a>	<a href="https://id.kb.se/language/swe">https://id.kb.se/language/swe</a>	<a href="https://id.kb.se/language/swe">https://id.kb.se/language/swe</a>
genreForm	<a href="https://id.kb.se/marc/Novel">https://id.kb.se/marc/Novel</a>	<a href="https://id.kb.se/marc/FictionNotFurtherSpecified">https://id.kb.se/marc/FictionNotFurtherSpecified</a>	<a href="https://id.kb.se/marc/Novel">https://id.kb.se/marc/Novel</a>	<a href="https://id.kb.se/marc/Novel">https://id.kb.se/marc/Novel</a>	<a href="https://id.kb.se/marc/Novel">https://id.kb.se/marc/Novel</a>
numPages	241	241	255	255	255
hasTitle	Perelandra	Perelandra	Perelandra.	Perelandra	Perelandra
classification	kssb, 5: He=c kssb, 6: Hcee.01	kssb: Hce	kssb, 7: He.01=c	kssb, 6: He.01=c	kssb, 6: He.01=c kssb, 6: Hcee.01
contribution	aut: C. S., Lewis, 1898-1963 trl: Gunnar Gällmo, 1946-	aut: C. S., Lewis, 1898-1963	aut: C. S., Lewis, 1898-1963 trl: Gunnar Gällmo, 1946-	aut: C. S., Lewis, 1898-1963 trl: Gunnar Gällmo, 1946-	aut: C. S., Lewis, 1898-1963 trl: Gunnar Gällmo, 1946-
instance title	{{@type=Title, mainTitle=Perelandra}}	{{@type=Title, mainTitle=Perelandra}}	{{@type=Title, mainTitle=Perelandra}}	{{@type=Title, subtitle=roman, mainTitle=Perelandra}}	{{@type=Title, subtitle=roman, mainTitle=Perelandra}}
work title	{{@type=Title, mainTitle=Perelandra}}	{{@type=Title, mainTitle=Perelandra}}	{{@type=Title, mainTitle=Perelandra.}}	{{@type=Title, mainTitle=Perelandra}}	{{@type=Title, mainTitle=Perelandra}}
instance type	Instance	Instance	Instance	Instance	Print
editionStatement	[Ny utg.]		[Ny utg.]	Nyutg.	[Ny utg.]
responsibilityStatement	C. S. Lewis ; övers.: Gunnar Gällmo		C. S. Lewis ; översättning: Gunnar Gällmo	C. S. Lewis ; [översättning: Gunnar Gällmo]	C. S. Lewis ; [översättning: Gunnar Gällmo]
encodingLevel	marc:FullLevel	marc:AbbreviatedLevel	marc:FullLevel	marc:FullLevel	marc:FullLevel
publication	1981 • Delta • Bromma • <a href="https://id.kb.se/country/sw">https://id.kb.se/country/sw</a>	1975 • Delta • Bromma • <a href="https://id.kb.se/country/sw">https://id.kb.se/country/sw</a>	2005 • Libris • Örebro • <a href="https://id.kb.se/country/sw">https://id.kb.se/country/sw</a>	1998 • Libris • Örebro • <a href="https://id.kb.se/country/sw">https://id.kb.se/country/sw</a>	1992 • Libris • Örebro • <a href="https://id.kb.se/country/sw">https://id.kb.se/country/sw</a>
identifiedBy	9172282770 • 53:00	9172280395	9171957812 • kartonnage	9171952438 • 72:00	9171948910 • INB. • 165:00
extent	241 s.	241 s.	255, [1] s.	255, [1] s.	255, [1] s.

# Connecting data - Libris in context

Not only “things” in one system but an ecosystem of data. How well can we marry different worldviews/ontologies to make sense of things outside our box?

We use KBV, our application ontology mapped to BIBFRAME which gives us flexibility.

<https://id.kb.se/vocab/>

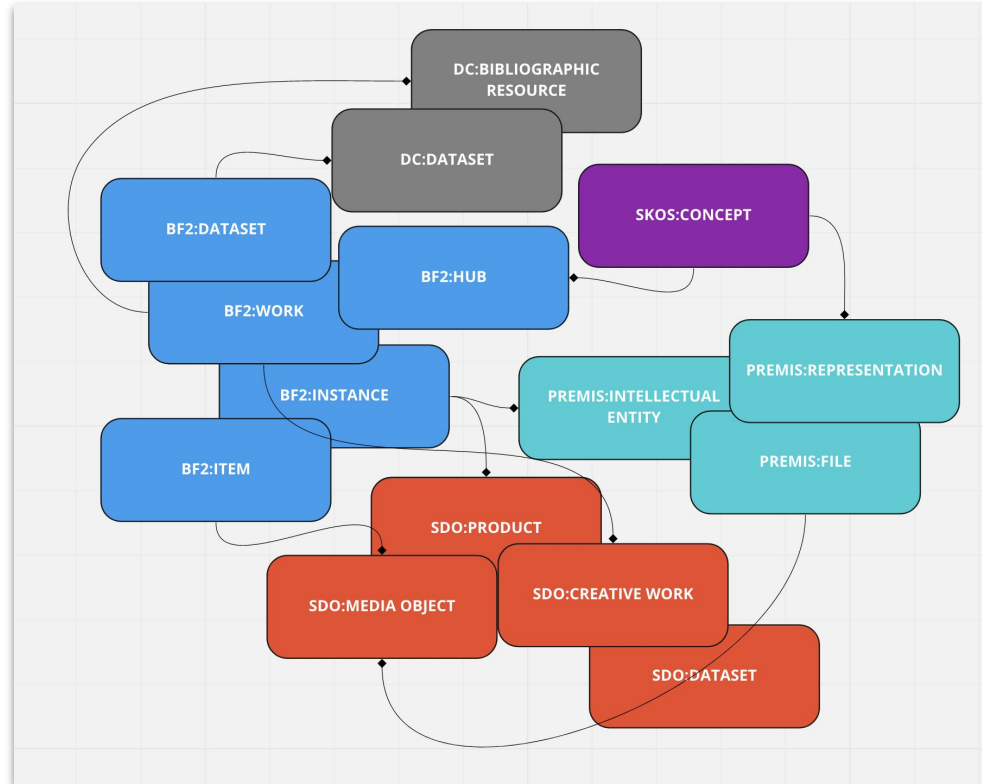
# RDFS and OWL as Mapping Tools

`rdfs:subPropertyOf` `rdfs:subClassOf`  
`owl:equivalentProperty` `owl:equivalentClass`

`owl:propertyChainAxiom`

`rdfs:domain`  
`rdfs:range`  
`rdf:Statement`

# BIBFRAME in a context?



# Defining boundaries?

What is the core duty of the Bibframe ontology? Providing a bridge from library collections in MARC to Linked data?

How do we view content acquired through digitization or born digital: Embedded file metadata, Use of Schema.org/Dublin Core for accessibility in Epub3 for example?

Understand the structural differences in descriptions!

## Vocabulary Maps (BF → DCT / Schema.org)

```
prefix : <http://id.loc.gov/ontologies/bibframe/>

</work/a> a :Print ;
  :carrier lcarrier:nc ;
  :instanceOf </abstract/a> ;
  :identifiedBy [ a :Isbn ;
    rdf:value "12-3456-789-0" ] ;
  :provisionActivity [ a :Publication ;
    :agent </org/a> ;
    :date "2017" ] .

</abstract/a> a :Text ;
  :content :Text ;
  :title [ :mainTitle "A" ] ;
  :contribution [ :agent </person/a> ;
    :role lcrel:ill ] .
```

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

</work/a> a :BibliographicResource ;
  :format bf:Print ;
  :isFormatOf </abstract/a> ;
  :identifier "12-3456-789-0" ;
  :issued "2017" ;
  :publisher </org/a> .

</abstract/a> a :BibliographicResource ;
  :contributor </person/a> ;
  :title "A" .
```

```
prefix : <http://schema.org/>

</work/a> a :Book,
  :Product ;
  :exampleOfWork </abstract/a> ;
  :isbn "12-3456-789-0" ;
  :datePublished "2017" ;
  :publisher </org/a> .

</abstract/a> a :Book ;
  :illustrator </person/a> ;
  :name "A" .
```

# Moving forward

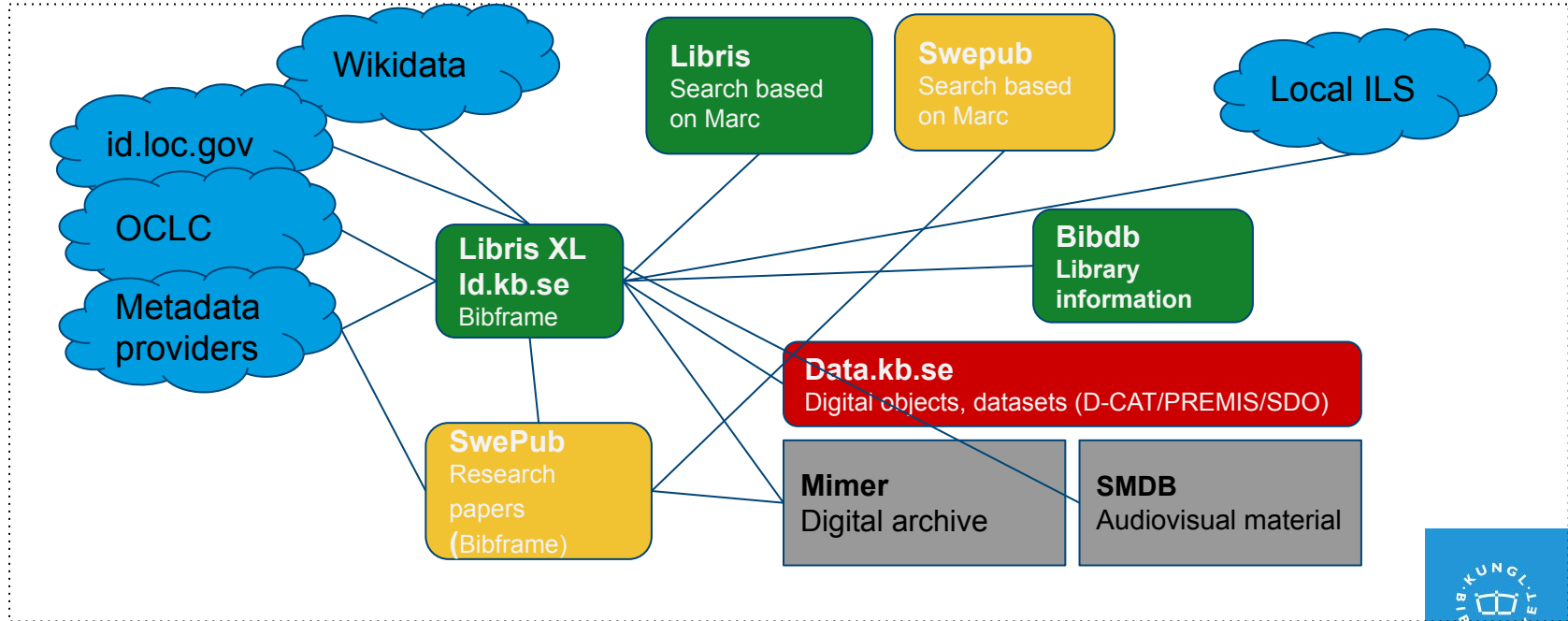


# Providing scenarios and use-cases

1. *When do we only need links to facilitate further exploration?*
2. *When do we need to to cached snapshots in our indexes for search?*
3. *When do we need a more stable entity and provide, for example a Swedish version? (still linking to the source of course)*

When is BIBFRAME enough to express what we need?

# Link/Cache/Copy/Transform?



# Data exchange?

Please tune in to the panel on day 3!

# Discovery?

More work needs to be done exploring and prototyping the possibilities of Linked data applications.

# Metadata and/or content?

## A personal reflection...

When content is digital the possibility to transcribe, classify, find entities in text, images, audio etc with Machine Learning is already a fact.

There will be a greater need to describe the automated processes and activities as they happen, since we cannot always rely on set rules.

Metadata can be extracted, re-extracted, analyzed, re-analyzed all as algorithms get better. And much more 'on demand' than before.

# Questions?

[fredrik.klingwall@kb.se](mailto:fredrik.klingwall@kb.se) either by mail or in the slack chat.

Presentations from earlier conferences is also available at <https://www.casalini.it/bfwe2021/>