



Linked open data in Legal Cultural Heritage

7 April 2022

Prof.ssa Monica Palmirani

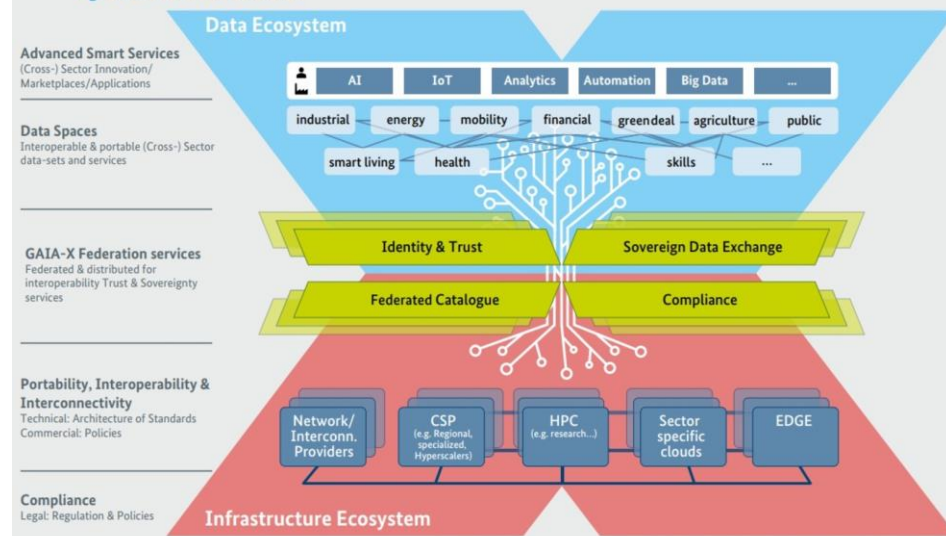
CIRSFID- Alma AI – Università di Bologna



Cultural Data Space

- Common European data space for cultural heritage
- Recommendation 2021/1970 of 10 November 2021
- Cultural tourism represents up to 40% of all tourism in Europe;
- Cultural and creative industries contribute 3.95% of total EU value added (€477 billion);
- More than 8 million people are employed by the cultural and creative industries, through 1.2 million firms - 99.9% of which are SMEs

Figure 2: GAIA-X Overview



Brussels, 10.11.2021
C(2021) 7953 final

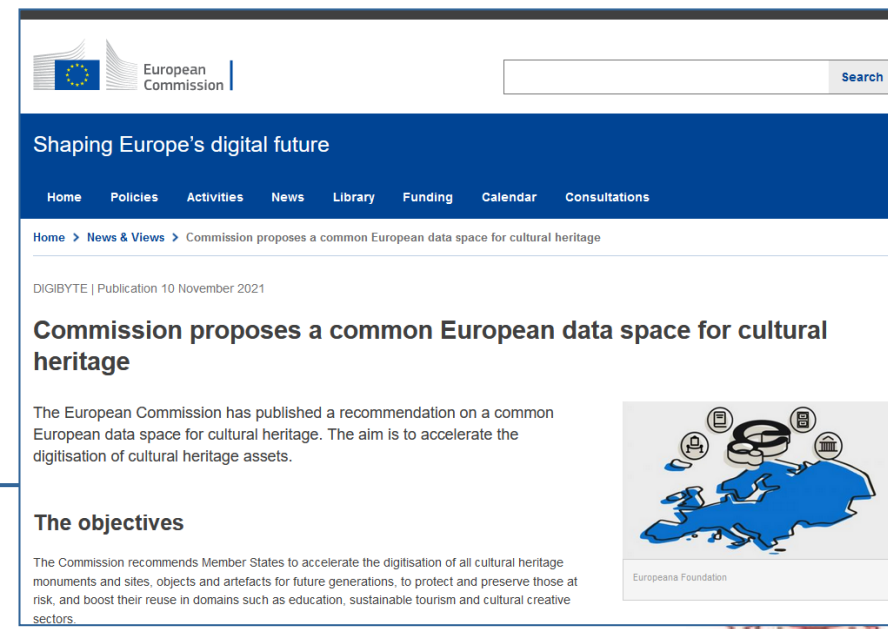
COMMISSION RECOMMENDATION

of 10.11.2021

on a common European data space for cultural heritage

Europeana

- Europeana currently offers access to 52 million cultural heritage assets, 45% of which can be reused in various sectors;
- Images and text make up 97.5% of Europeana's assets, with only 2.47% audiovisual content and 0.03% in 3D. The collection of 3D as



**EU DIRECTIVE
PSI 1 2003/98/CE
2013/37/UE
PSI 2 2019/1024**

Regulations

Data Government ACT

Data ACT

Copyright Directive



Licenze standard Creative Commons



Brussels, 22.2.2019
C(2019) 1655 final

COMMISSION DECISION

of 22.2.2019

adopting Creative Commons as an open licence under the European Commission's
reuse policy

- (7) As a complementary measure — and acknowledging the intrinsic differences between different categories of documents — the aforementioned Directors-General consider that specific documents, such as raw data resulting from instrument

readings, bibliographic data and other metadata, may be released into the public domain in order to achieve the maximum degree of reusability by the general public.

HAS DECIDED AS FOLLOWS:

Article 1

Creative Commons Attribution 4.0 International Public License (CC BY 4.0) is adopted as an open licence for the Commission's reuse policy under Article 6 of Decision 2011/833/EU.

Article 2

Without prejudice to the preceding article, raw data, metadata or other documents of comparable nature may alternatively be distributed under the provisions of the Creative Commons Universal Public Domain Dedication deed (CC0 1.0).

Done at Brussels, 22.2.2019



Europeana CC0 license on metadata

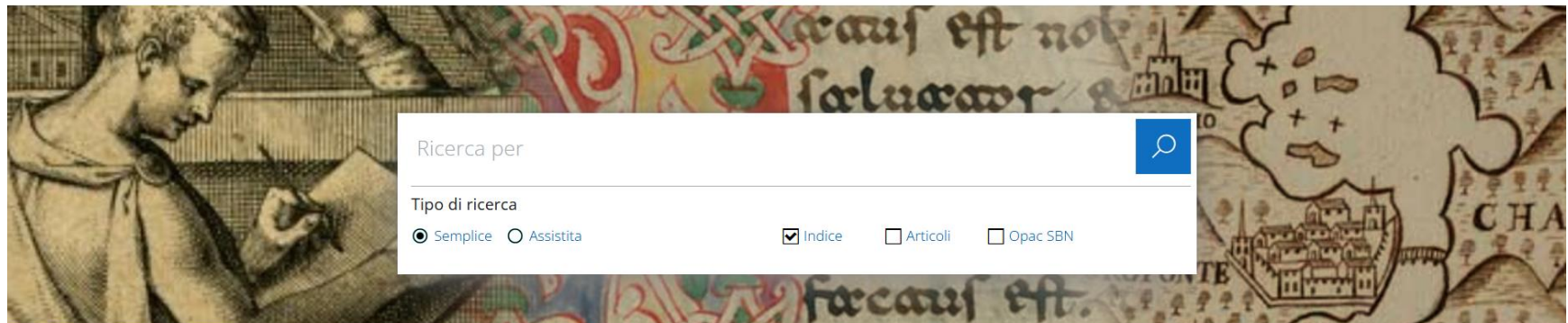
[ABOUT US](#)[JOIN THE NETWORK](#)[SHARE YOUR DATA](#)[Intro](#)[Tools](#)[Data structure](#)[Further Reading](#)[FAQ](#)

INTRODUCTION

Linked Open Data is a way of publishing structured data that allows metadata to be connected and enriched, so that different representations of the same content can be found, and links made between related resources. All Europeana datasets can be explored and queried through the [SPARQL API](#).

The metadata for all the objects in the Europeana portal is **open**, in that it is all licensed under the [CC0 Public Domain Dedication](#) under the terms of the [Data Exchange Agreement](#) (DEA), and can be freely downloaded via the API.





BENI CULTURALI ENTI TIPO

Indice delle risorse

Licenza

- Con attribuzione, senza riuso commerciale (1.819.029)
- Diritti sconosciuti (885.560)
- Diritti riservati (588.712)
- Con attribuzione, riuso commerciale (48.752)
- Pubblico Dominio (24.622)

Indice delle risorse

PAGINA 1 DI 730 (7.293 RISULTATI TROVATI)

1 2 3 4 5 6 7

RAFFINA

Filtri applicati

- × Fonte dati = Biblioteca Digitale Trentina
- × Licenza = Pubblico Dominio

Fonte dati

- Cartoline (5.622)
- Carte geografiche (886)
- Incisioni (533)
- Disegni (252)

Data di creazione

- 1920-1930 (331)
- 1910-1920 (276)
- 1950-1960 (274)
- 1960-1970 (270)
- 1900-1910 (260)
- 1970-1980 (257)
- 1710 (223)



Trento Il Duomo.

Biblioteca Digitale Trentina
oai:bdt.bibcom.trento.it:10000

consulta la scheda esterna



Trento Il Duomo.

Biblioteca Digitale Trentina
oai:bdt.bibcom.trento.it:10001

consulta la scheda esterna



Trento Piazza del Duomo e Torre Grande.

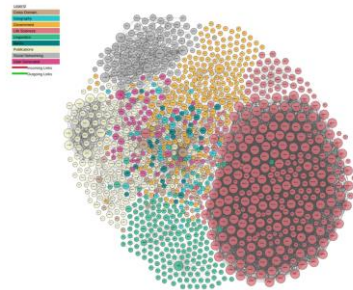
Biblioteca Digitale Trentina
oai:bdt.bibcom.trento.it:10002

consulta la scheda esterna



Linked Open Data

The Linking Open Data cloud diagram
This web page is the home of the LOD cloud diagram. This image shows datasets that have been published in a Linked Data format, by contributors to the Linking Open Data community, and other individuals and organizations. It is based on a regularly collected and updated list of contributors to the LOD cloud. Clicking the image will take you to the interactive 3D version, where each dataset is a hyperlink to its entry in the cloud.
 The diagram is maintained by the Open Data Commons (ODC) project. For any questions and comments, please email open.data@open.datacommons.org and join the ODC@Google+ group. The original version was developed by Richard Cyganski and Arja Järvelin.
 Last updated: 2011-02-20



LINKED DATA

- ★ On the web, open license
 - ★ Machine-readable data
 - ★ Non-proprietary format
 - ★ RDF standards
 - ★ Linked RDF
- IS YOUR DATA 5 ★ ?



OL RE OF URI LD



OL RE OF URI

<http://data...>



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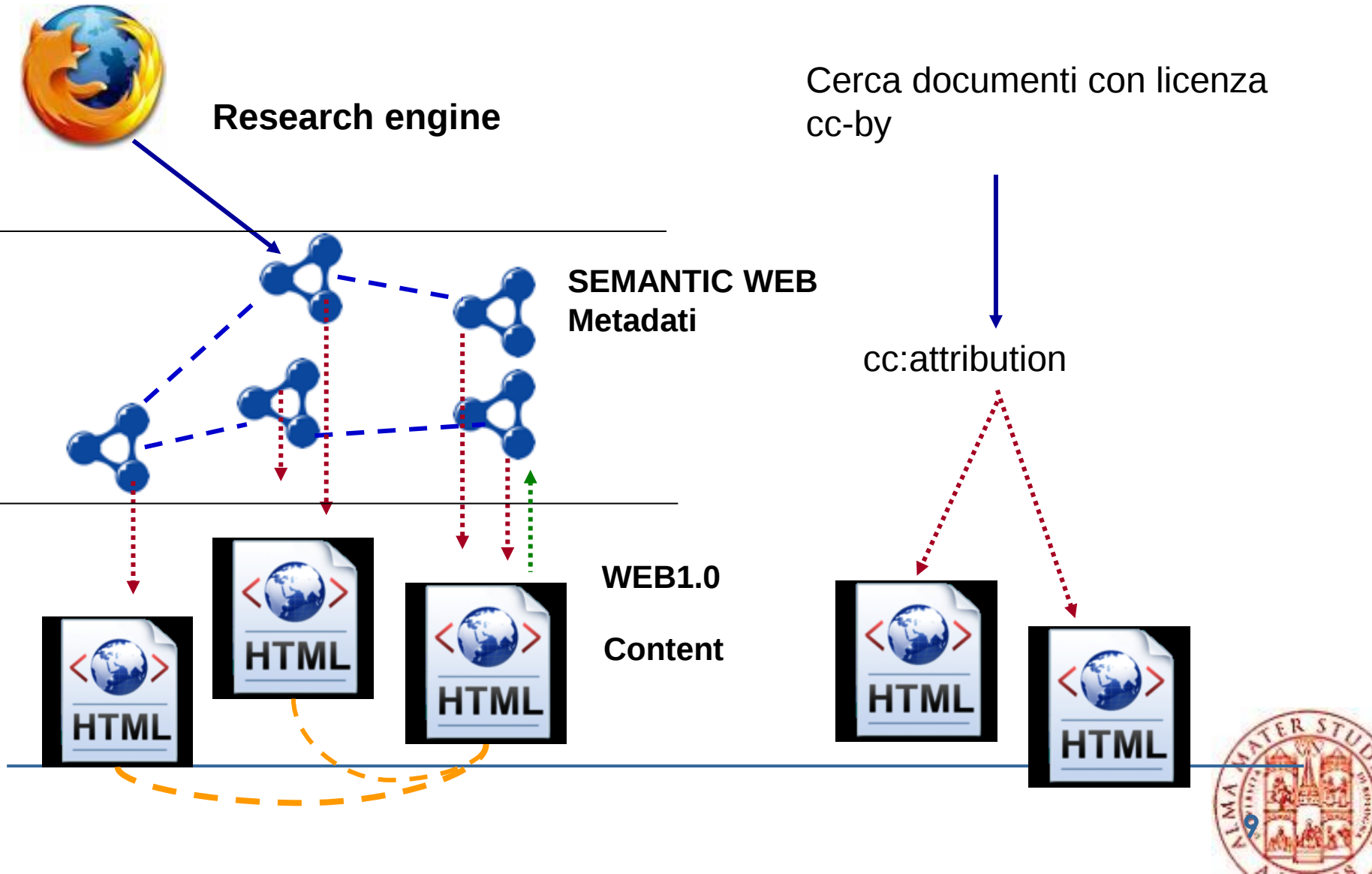
W3C RDF

OPEN DATA

HTML 5



Semantic Web and Licenses



Optimized Funding Cycle for Research Articles

Maximum dissemination, economic efficiency and social impact



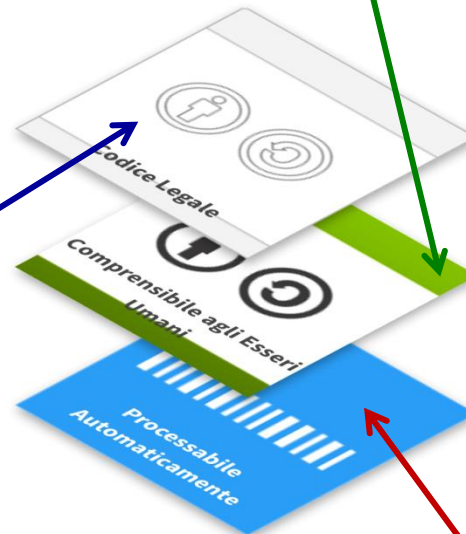
This document by Creative Commons, licensed CC BY
 Notes from The Open Project by CC BY 3.0: Adam Whitcroft (cloud upload) - Armand A. Nair (share) - Andrew Forrester (books) - Diego Nave (speaker, book) - Emma Villa Hopkins (turbo) - José Hernández (trend) - Henrik Lund Mikkelsen (journal) - Sotiris Papanikolaou (light bulb) - Thomas Weber (community) CC: Antonio Makrygiannis (scientist) - Arthur Schmidt (construction) - Dushyant (holder) - Fusion Strategy (download) - Max Hancock (brain) - Mike Webb (hourglass)

Example: CC

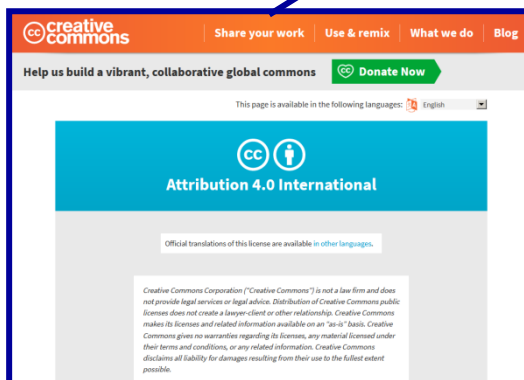
Icone per la semplificazione



Testo giuridico

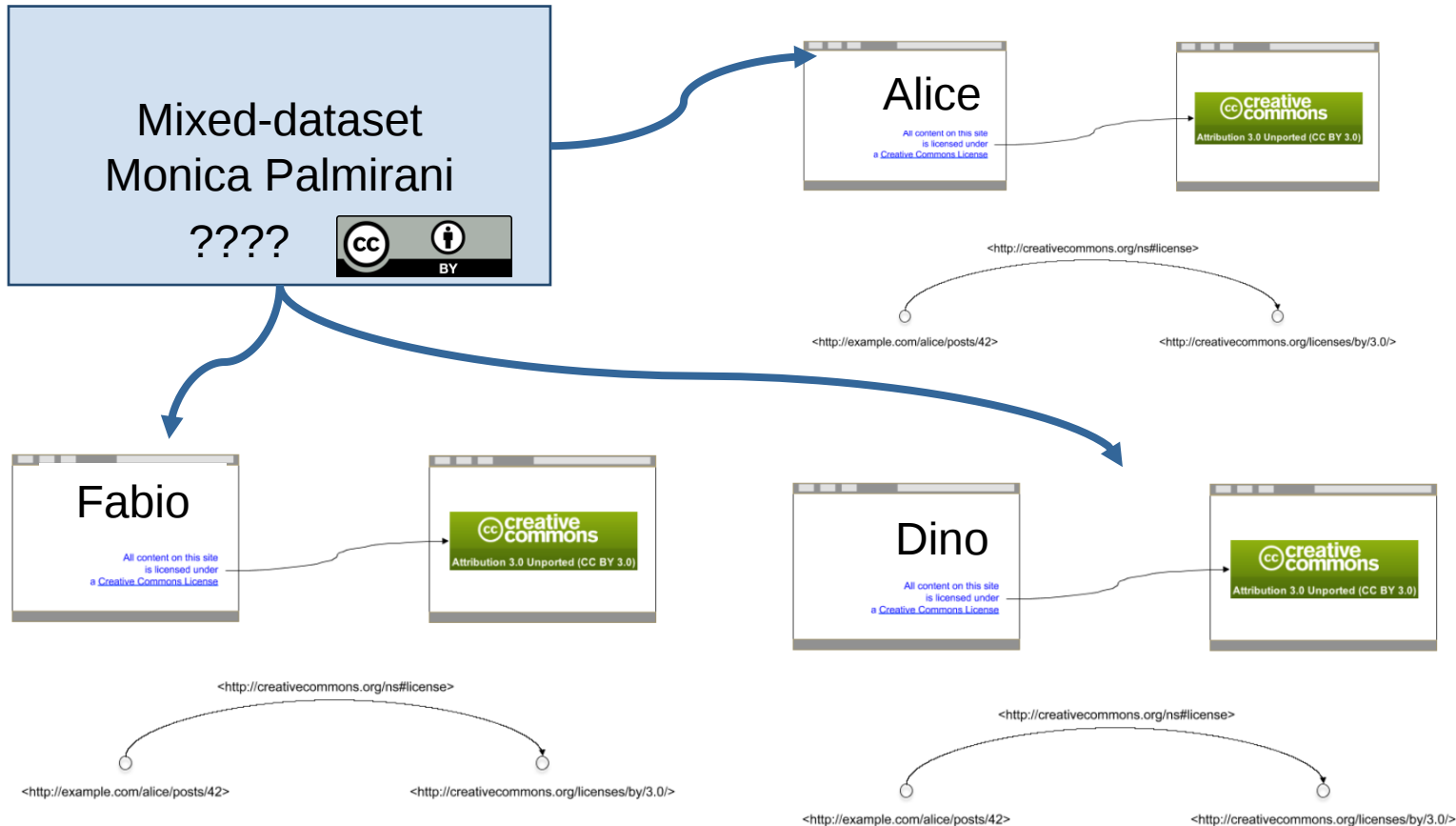


Codice comprensibile alle macchine

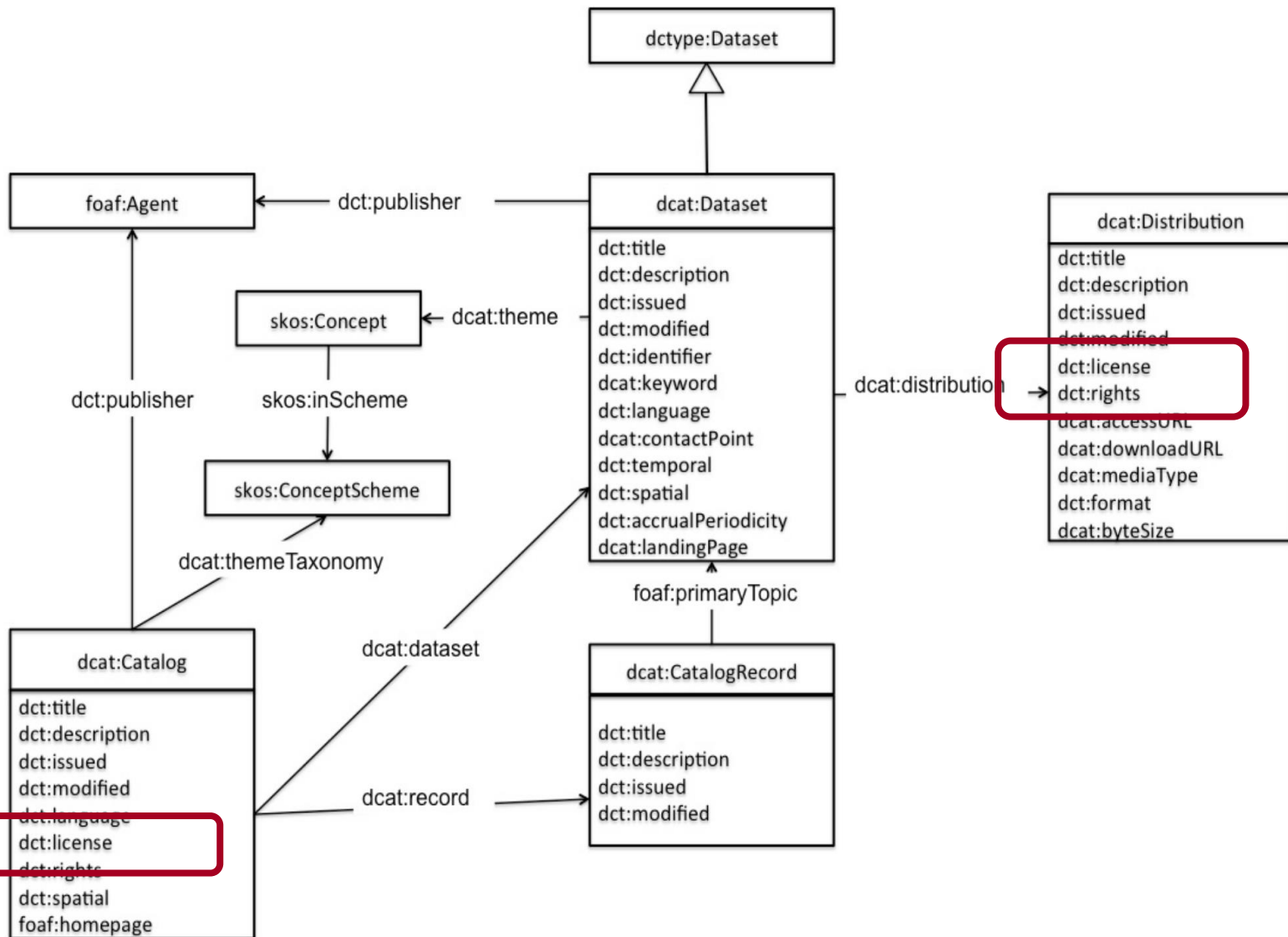


```
<a rel="license"
href="http://creativecommons.org/licenses/by-nc/4.0/">Creative Commons Attribution Non-Commercial 4.0 License</a>.
Permissions beyond the scope of this license may be available at <a
xmlns:cc="http://creativecommons.org/ns#" rel="cc:morePermissions"
href="https://myContent.org">myContent</a>.
```

Make an engine for querying the content based on licenses and permits to mix them accordingly



Open data metadati – DCAT-AP EU Schema



Simplified example

```
dct:license <https://creativecommons.org/licenses/by/4.0/>;  
cc:attributionURL <https://unibo.it/Monica>;  
cc:jurisdiction "EU";  
cc:permits cc:DerivativeWorks, cc:Distribtion, cc:Reproduction ;  
cc:requires cc:Notice ;
```

```
prov:wasDerivedFrom  
<https://unibo.it/FabioCollection>;  
cc:attributionURL < https://unibo.it/Fabio>;  
dct:license <https://creativecommons.org/licenses/by/4.0/>.  
prov:wasDerivedFrom  
<https://unibo.it/DinoCollection>;  
cc:attributionURL <https://unibo.it/Dino>;  
dct:license <https://creativecommons.org/licenses/by/4.0/>.
```



History of Law Manuscripts

- 2000-2007 - Irnerio
- 2008-2011 - Mosaico

CIRSFID :: IRNERIO - Microsoft Internet Explorer

File Modifica Visualizza Preferiti Strumenti ?

Indietro - - - - - Cerca Preferiti

Indirizzo <http://irnerio.cirsfid.unibo.it/browser/282/069r/> Collegamenti »

CIRSFID Irnerio

Il Progetto

- Homepage
- Presentazione
- Enti partecipanti
- Help
- Logout

Codici

- Codici
- Ricerca Autori
- Ricerca Libera
- Ricerca per lemmi

Contratto

- Contratto
- Contract

Amministra

- Profilo
- La mia collezione
- Amministra

Alta definizione



« Indietro **069r** Avanti »

Codice: 282

3 - Authenticum cum glossa Accursii

Da folio 069r a folio 198r

AUTORE

Iustinianus imperator

EDIZIONE

ripetutamente edito.

INCIPIT

(del testo; sotto In nomine Domini nostri Iesu Christi de hereditibus et Falcidia constitutio prima si heres legata solvere noluerit. Incipit constitutio imperatoris Iustiniani Augusti Iohanni pape secundo Rubrica) Occupatis nobis circa totius reipublice curas (della glossa) In nomine Domini: Iustinianus opus suum laudabile Deo attribuit

EXPLICIT

(del testo) imperpetuum valituras nostra sancxit tranquillitas per omnia custodiri provideat.

Altre opere

Altre opere appartenenti allo stesso codice

- 1. Institutiones Iustini...
- 2. Arbor actionum cum gl...
- 4. Tres libri cum glossa...
- 5. Consuetudines feudoru...
- 6. Constitutio 'Ad decus...

Operazione completata

Internet

start C... P... C... M... I... C... F... 9.59

<http://irnerio.cirsfid.unibo.it/browser/285/011r/>



Heterogeneous content

Additional
links

Goffridus s. adrianus diaconus cardinalis

codex

RDF

Comment
from
expert

Additional
links

work

fogli

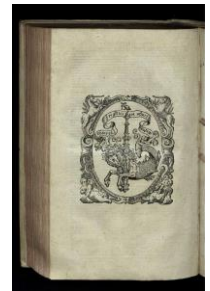
Sub-work

sheets

bibliography

authors

Manuscript



GDZ
Göttinger Digitalisierungszentrum

External link



Irnerio

- 289 manuscripts from Real College of Spain - 138.908 images
- Metadati: annotated with expert metadata *Maffei*
- Informazioni: bibliography
- Ontologia: thesaurus
- Images (400 x 600 pixel jpg), (4000x4000 pixel jpg) (tiff)
- 500 GB

IRNERIO

CIRSFID :: IRNERIO - Microsoft Internet Explorer

File Modifica Visualizza Preferiti Strumenti ?



Indirizzo <http://irnerio.cirsfid.unibo.it/browser/282/069r/>

Collegamenti >>

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6. Constitutio 'Ad decus...

Operazione completata

Internet



Manoscritto di Goffredo da Trani – Montecassino 266 – Descrizione di Martrin Bertram

Titolo

Premessa

Introduzione

Manoscritto

Descrizione

Indice dei titoli

Liber I

Liber II

Goffredus Sci Adriani Diaconus cardinalis

† Goffredus Sci Adriani Diaconus card.

**GOFFREDUS TRANENSIS
APPARATUS DECRETALIU**

Mosaico - Didascalia

firma autografa di Goffredo, posta tra il 3 luglio e il 12 novembre 1244 nel Liber Memorialis di S. Giulia di Brescia; Ms. Brescia, Bibl. Queriniana, Cod. G. VI.7 fol. 39r; ripresa dalla riproduzione completa del codice a cura di D. Geuenich, U. Ludwig, Der Memorial- und Liturgiecodex von San Salvatore / Santa Giulia in Brescia, Monumenta Germaniae Historica. Libri memoriales et necrologia n. s. IV, Hannover 2000; cf. p. 121 nota 420 e p. 180; per la datazione cf. DBI 57, p. 546.

Le due immagini riprodotte nel titolo

a) firma autografa di Goffredo, posta tra il 3 luglio e il 12 novembre 1244 nel Liber Memorialis di S. Giulia di Brescia; Ms. Brescia, Bibl. Queriniana, Cod. G. VI.7 fol. 39r; ripresa dalla riproduzione completa del codice a cura di D. Geuenich, U. Ludwig, Der Memorial- und Liturgiecodex von San Salvatore / Santa Giulia in Brescia, Monumenta Germaniae Historica. Libri memoriales et necrologia n. s. IV, Hannover 2000; cf. p. 121 nota 420 e p. 180; per la datazione cf. DBI 57, p. 546.

Mosaico - Immagine

Goffredus Sci Adriani Diaconus cardinalis

MON

(Immagine Precedente Immagine Successiva)

Disattiva Zoom Attiva lente

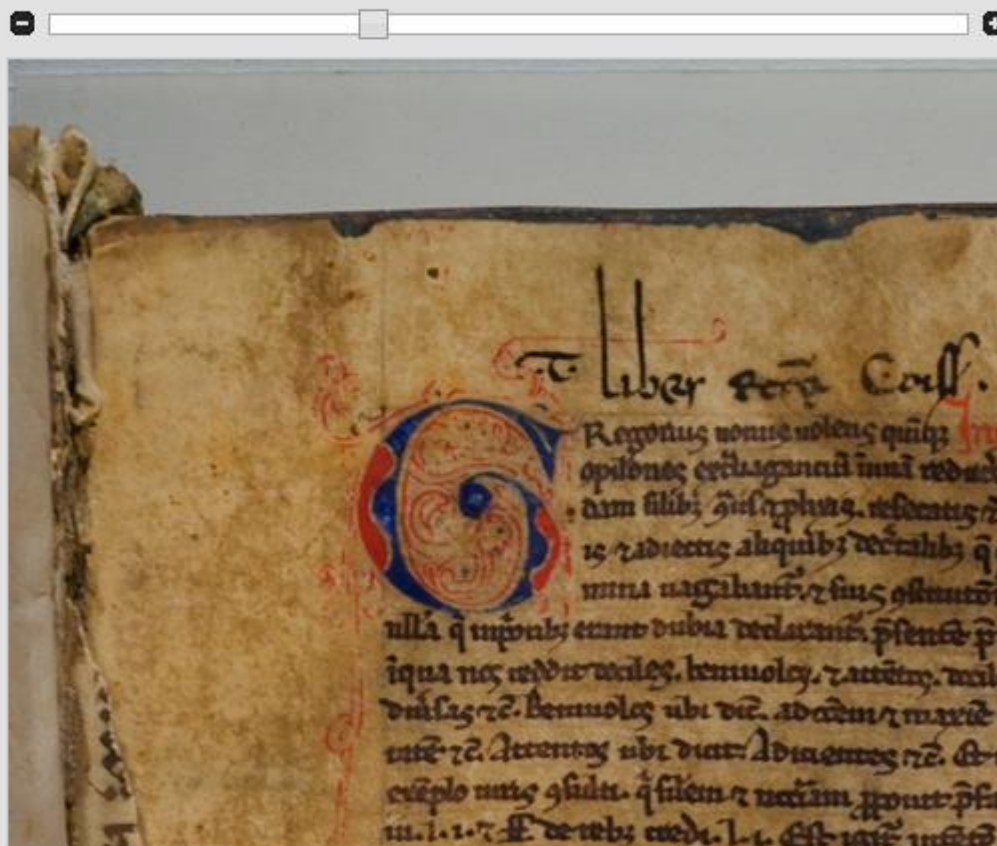
1	<u>2</u>	...	<u>76</u>	»
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pagina 1



pagina 2



300 pagin

Legatura

dall'alto :

in Decret

ingiallime

tempo se

Pergame

strappi :

riconosci

prevalent

sono rinf

scrittura beneventana (non menzionato negli elenchi di V. Brown, del quale cf. ultimamente in: *Medieval Studies* 70, 2008, p. 275-355).

Watermarking

- Also those metadata are important – watermarking is not transparent to the Semantic Web

Manoscritto della Biblioteca Nazionale di Praga - Digitalizzato dall'Unità di Roma Tre.

Future work

- Transform all the material in AKN and Linked Open Data
- Use DCAT-AP for licenses and PROV for provenance
- Define methodology for contributing in European without affect the scientific knowledge of the experts



References

Thanks!

monica.palmirani@unibo.it

