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Hiob Ludolf Zentrum für Äthiopistik

beta maṣāḥəft
Manuscripts of Ethiopia and Eritrea

La 'Syntaxe du codex' and TEI. Models, mappings and visualization tools

10.5.2018 Hamburg

A. Beta maṣāḥəft: Manuscripts of Ethiopia and Eritrea

Collaborations and metadata interoperation with other projects

(ʾAsir Matirā Dabra ʿAlamā Qəddəst Maryam[gez])

> alt: አሲረ፡ መቲራ፡[gez] (ʾAsira Matirā[gez])

> alt: አስር፡ መቲራ፡[gez] (ʾAsər Matirā[gez])

> alt: አሽር፡ መቲራ፡[gez] (ʾAšər Matirā[gez])

> alt: ደብረ፡ ዓሊማ፡[gez] (Dabra ʿĀlimā[gez])

> alt: ደብረ፡ ዓለማ፡[gez] (Dabra ʿĀlamā[gez])

Appellations

Bibliography

Secondary Bibliography

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- Nosnitsin, D. 2013. *Churches and Monasteries of Tagray. A Survey of Manuscript Collections*, Supplement to Aethiopica, 1 (Wiesbaden: Harrassowitz Verlag, 2013).

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Administrative position

settlement	Baḥerāwi Kəllələwi Mangəšti Təgrāy
settlement	A◆◆sbi Wämbärta
settlement	ʾAsir Matirā
region	Baḥerāwi Kəllələwi Mangəšti Təgrāy

its id.

ID Title

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date range

languages 3

en (43860)
gez (39208)
it (42257)

Data provenance

all

keywords 8

ApocryphaPseudoepigrapha (
CanonLaw (56)
Homily (302)
Missal (117)

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Name	Shelfmarks	Images	Textual Units	Manuscript Parts	Hands	Script	Text	Dated	TEI-XML	Analytics	Print
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Baḥerāwi Kəllələwi Mangəšti Təgrāy, ʾAsir Matirā, AM-007	AM-007		3	1	1	Ethiopic		N/A	XML		
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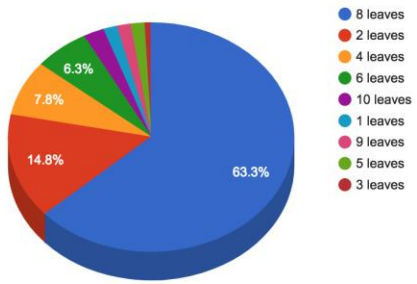

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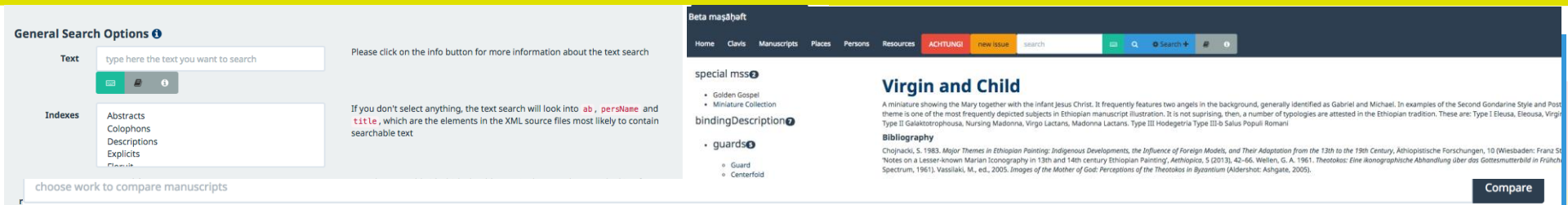

Compare manuscripts which contain Hagiography of Lālibalā

They are currently 8.

Vatican City, Biblioteca Apostolica Vaticana, Biblioteca Apostolica Vaticana Cerulli 223 (1830-1974)

ms_i1 (complete), Hagiography of Lālibalā (ff. 5ra-124va)
ms_i1.1 (complete), Life of Lālibalā
ms_i1.2 (complete), King Lālibalā and the three Angels (ff. 108va-109vb)
ms_i1.3 (complete), How the river swallowed Lālibalā's honey and then spit it out (ff. 110ra-112va)
ms_i1.4 (complete), How Lālibalā became like a poor (ff. 112va-114rb)
ms_i1.5 (complete), Lālibalā and a rebel (ff. 114rb-116va)
ms_i1.6 (complete), How a prayer to Lālibalā saved a rich woman (ff. 116va-117ra)
ms_i1.7 (complete), How a prayer to Lālibalā saved a man (ff. 117ra-118ra)
ms_i1.8 (complete), Story about virtuous Deeds of Lālibalā (ff. 118ra-124vb)
ms_i2 (complete), No item: LIT4932HagLal (ff. 124vb-125rb)
ms_i3 (complete), No item: LIT4931MirLal (ff. 125va-127va)
ms_i4 (complete), Gadla Yəmrəḥanna Krəstos (ff. 129r-164r)

London, British Library, BL Oriental 718 (1837-1839)

ms_i1 (complete), Hagiography of Lālibalā (ff. 1r-130vb)
ms_i1.1 (complete), Life of Lālibalā (ff. 1r-115rb)
ms_i1.2 (complete), King Lālibalā and the three Angels (ff. 115rb-116vb)
ms_i1.3 (complete), How the river swallowed Lālibalā's honey and then spit it out (ff. 116vb-119ra)
ms_i1.4 (complete), How Lālibalā became like a poor (ff. 119rb-120va)
ms_i1.5 (complete), Lālibalā and a rebel (ff. 120va-122rb)
ms_i1.6 (complete), How a prayer to Lālibalā saved a rich woman (ff. 122va-122vb)
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ms_i2.2, Christology and Lālibalā
ms_i2.3, Praise of King Lālibalā's virtues.
ms_i2.4, Praise of King Lālibalā's virtues.
ms_i2.5, Praise of King Lālibalā's virtues.

London, British Library, BL Oriental 718 (1837-1839)

ms_i1 (complete), Hagiography of Lālibalā (ff. 1r-130vb)
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ms_i2.3, Praise of King Lālibalā's virtues.
ms_i2.4, Praise of King Lālibalā's virtues.
ms_i2.5, Praise of King Lālibalā's virtues.

London, British Library, BL Indian Office Collection MS Ethiopic 4 (1838-1842)

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London, British Library, BL Indian Office Collection MS Ethiopic 4 (1838-1842)

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ms_i2 (complete), Hagiography of Lālibalā (ff. 140v-162v)

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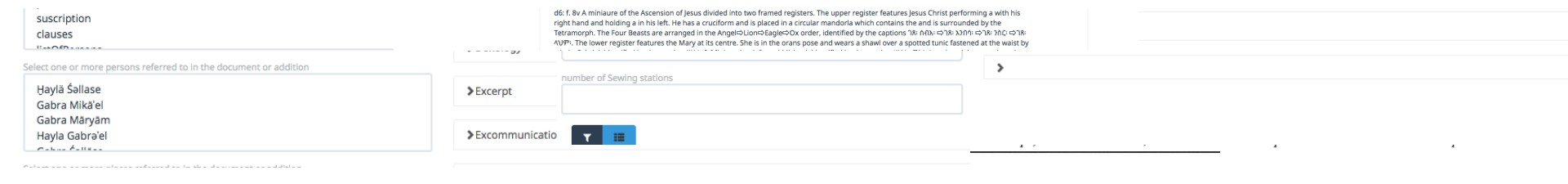

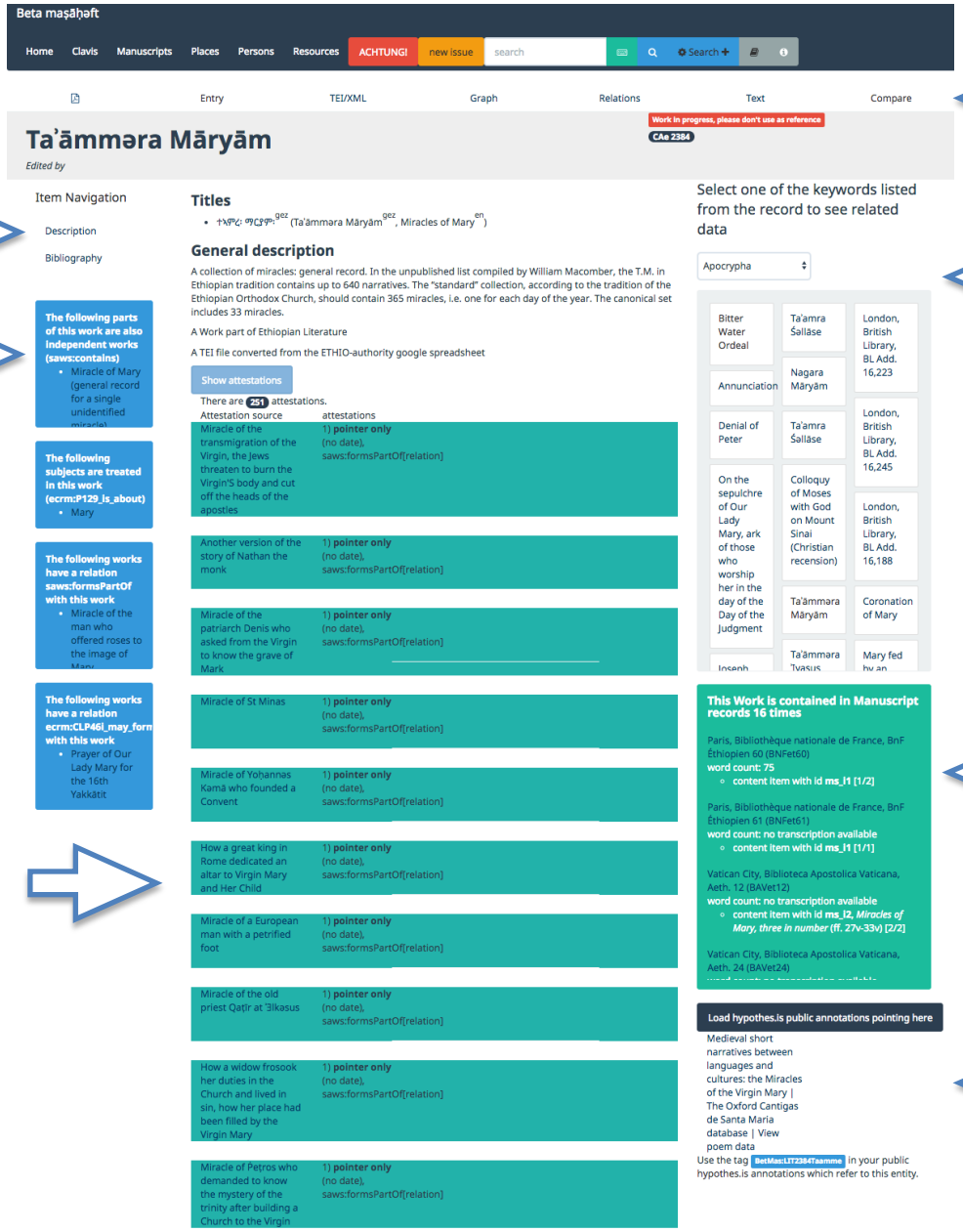

Main metadata

Main relations to other items

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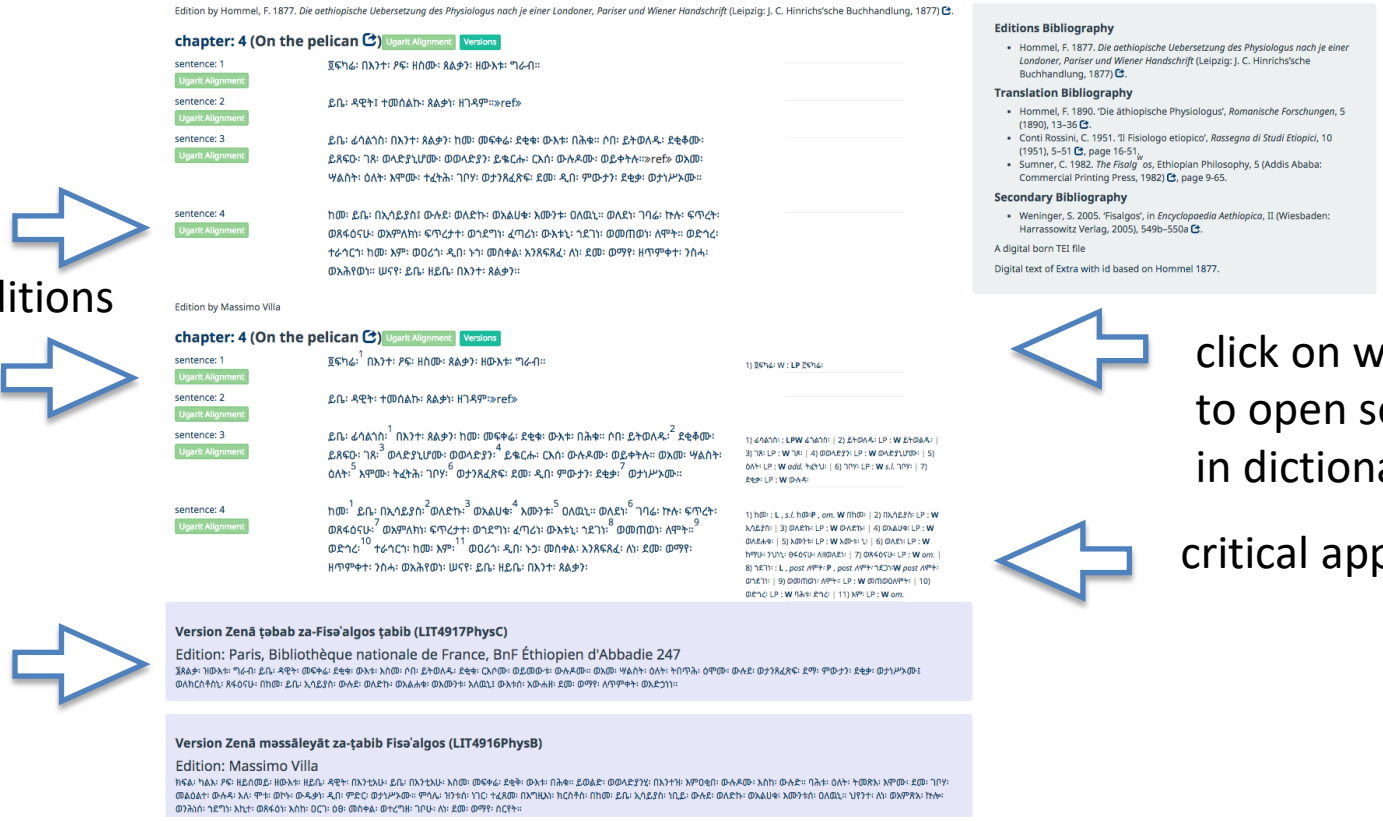

Edition by Hommel, F. 1877. *Die aethiopische Uebersetzung des Physiologus nach je einer Londoner, Pariser und Wiener Handschrift* (Leipzig: J. C. Hinrichs'sche Buchhandlung, 1877)

chapter: 4 (On the pelican) Ugarit Alignment Versions

sentence: 1 — Ugarit Alignment — ፬ፍካፅ፡ በእንተ፡ ዖፍ፡ ዘስሙ፡ ጰልቃን፡ ዘውእቱ፡ ግራብ።

sentence: 2 — Ugarit Alignment — ይቤ፡ ጻዊት፤ ተመሰልኩ፡ ጰልቃነ፡ ዘገጸሞ።»ref»

sentence: 3 — Ugarit Alignment — ይቤ፡ ፊሳልጎስ፡ በእንተ፡ ጰልቃን፡ ከመ፡ መፍቀሬ፡ ደቂቁ፡ ውእቱ፡ በሕቁ። ሶበ፡ ይትወለዱ፡ ደቂቆሙ፡ ይጸፍር፡ ገጾ፡ ወላድያኒሆሙ፡ ወወላድያን፡ ይቄርሑ፡ ርእሰ፡ ውሉዶሙ፡ ወይቀትሉ።»ref» ወእመ፡ ሣልስት፡ ዕለት፡ እሞሙ፡ ተፈትሕ፡ ገቦሃ፡ ወታንጸፈጽፍ፡ ደመ፡ ዲቡ፡ ምውታን፡ ደቂቃ፡ ወታነሥኦሙ።

sentence: 4 — Ugarit Alignment — ከመ፡ ይቤ፡ በኢሳይያስ፤ ውሉደ፡ ወለድኩ፡ ወአልሀቁ፡ እመንቱ። ዐለዉኒ። ወለደነ፡ ገባሬ፡ ኩሉ፡ ፍጥረት፡ ወጸፋዕናሁ፡ ወአምላክነ፡ ፍጥረታተ፡ ወጎደግነ፡ ፈጣሪነ፡ ውእቱኒ፡ ጎደገነ፡ ወመጠወነ፡ ለሞትኒ። ወድኅረ፡ ተራኅርኅ፡ ከመ፡ እም፡ ወዐሪጎ፡ ዲቡ፡ ኑኃ፡ መስቀል፡ እንጸፍጸፈ፡ ለነ፡ ደመ፡ ውማየ፡ ዘጥምቀተ፡ ንስሓ፡ ወአሕየወነ። ሠናየ፡ ይቤ፡ ዘይቤ፡ በእንተ፡ ጰልቃን።

Edition by Massimo Villa

chapter: 4 (On the pelican) Ugarit Alignment Versions

sentence: 1 — Ugarit Alignment — ፬ፍካፅ[1] በእንተ፡ ዖፍ፡ ዘስሙ፡ ጰልቃን፡ ዘውእቱ፡ ግራብ።

sentence: 2 — Ugarit Alignment — ይቤ፡ ጻዊት፡ ተመሰልኩ፡ ጰልቃነ፡ ዘገጸሞ።»ref»

sentence: 3 — Ugarit Alignment — ይቤ፡ ፊሳልጎስ፡[1] በእንተ፡ ጰልቃን፡ ከመ፡ መፍቀሬ፡ ደቂቁ፡ ውእቱ፡ በሕቁ። ሶበ፡ ይትወለዱ፡[2] ደቂቆሙ፡ ይጸፍር፡ ገጾ፡[3] ወላድያኒሆሙ፡ ወወላድያን፡[4] ይቄርሑ፡ ርእሰ፡ ውሉዶሙ፡ ወይቀትሉ። ወእመ፡ ሣልስት፡ ዕለት፡[5] እሞሙ፡ ትፈትሕ፡ ገቦሃ፡[6] ወታንጸፈጽፍ፡ ደመ፡ ዲቡ፡ ምውታን፡ ደቂቃ፡[7] ወታነሥኦሙ።

sentence: 4 — Ugarit Alignment — ከመ፡[1] ይቤ፡ በኢሳይያስ፡[2] ወለደኩ፡[3] ወአልሀቁ፡[4] እመንቱ።[5] ዐለዉኒ። ወለደነ፡[6] ገባሬ፡ ኩሉ፡ ፍጥረት፡ ወጸፋዕናሁ፡[7] ወአምላክነ፡ ፍጥረታተ፡ ወጎደግነ፡ ፈጣሪነ፡ ውእቱኒ፡ ጎደገነ፡[8] ወመጠወነ፡ ለሞትኒ።[9] ወድኅረ፡[10] ተራኅርኅ፡ ከመ፡ እም፡[11] ወዐሪጎ፡ ዲቡ፡ ኑኃ፡ መስቀል፡ እንጸፍጸፈ፡ ለነ፡ ደመ፡ ውማየ፡ ዘጥምቀተ፡ ንስሓ፡ ወአሕየወነ። ሠናየ፡ ይቤ፡ ዘይቤ፡ በእንተ፡ ጰልቃን፡

1) ፬ፍካፅ፡ W : LP ፯ፍካፅ

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1) ከመ፡ : L , s.l. ከመ፡P , *om.* W በከመ፡ | 2) በኢሳይያስ፡ LP : W ኢሳይያስ፡ | 3) ወለደኩ፡ LP : W ወላደኩ፡ | 4) ወአልሀቁ፡ LP : W ወለደቁ፡ | 5) እመንቱ፡ LP : W እመ፡ኒ፡ | 6) ዐለደነ፡ LP : W ከማሁ፡ ነህነ፡ ፀሩናነ፡ አእወለደነ፡ | 7) ወጸፋዕናሁ፡ LP : W *om.* | 8) ጎደገነ፡ : L , *post* ለሞት፡ P , *post* ለሞት፡ ጎደጋነ፡W *post* ለሞት፡ ወጎደገነ፡ | 9) ወመጠወነ፡ ለሞት፡ LP : W ወጠወልዎሞት፡ | 10) ወድኅረ፡ LP : W ባሕቱ፡ ድኅረ፡ | 11) እም፡ LP : W *om.*

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Digital text of Extra with id based on Hommel 1877.

Version Zenā ṭabab za-Fisaʾalgos ṭabib (LIT4917PhysC)

Edition: Paris, Bibliothèque nationale de France, BnF Éthiopien d'Abbadie 247

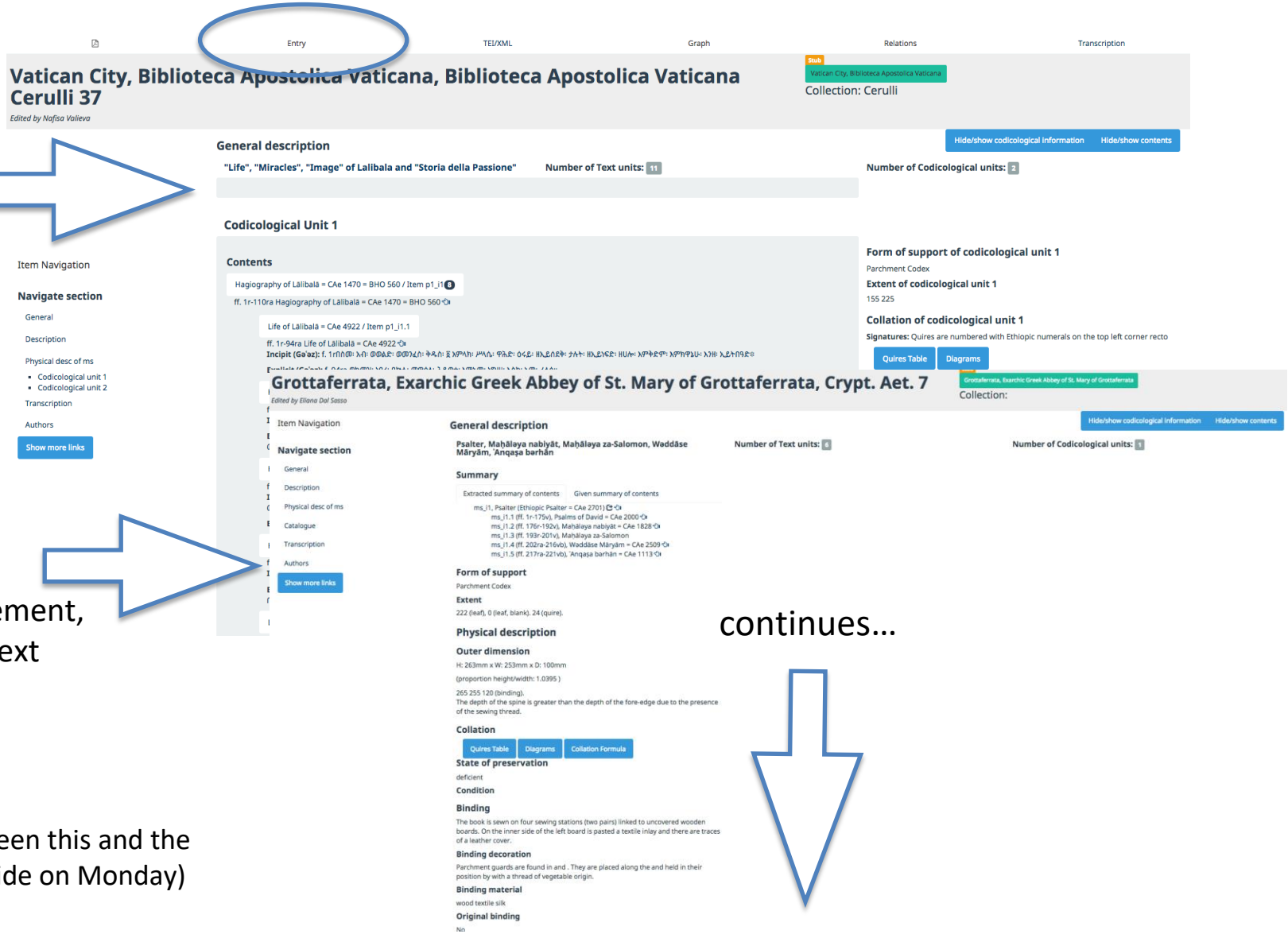
፮ጸልቃ፡ ዝውእቱ፡ ግራብ፡ ይቤ፡ ጻዊት፡ መፍቀሬ፡ ደቂቁ፡ ውእቱ፡ እስመ፡ ሶበ፡ ይትወለዱ፡ ደቂቁ፡ ርእሶሙ፡ ወይመውቱ፡ ውሉዶሙ። ወእመ፡ ሣልስት፡ ዕለት፡ ትበጥሕ፡ ዕሞሙ፡ ውሉደ፡ ወታንጸፈጽፍ፡ ደማ፡ ምውታን፡ ደቂቃ፡ ወታነሥኦሙ፤ ወለክርስቶስኒ፡ ጸፋዕናሁ፡ በከመ፡ ይቤ፡ ኢሳይያስ፡ ውሉደ፡ ወለድኩ፡ ወአልሐቁ፡ ወእመንቱ፡ አለዉኒ፤ ወአከብ፡ አውሐዙ፡ ደመ፡ ውማየ፡ ለጥምቀት፡ ወአድኃነነ።

Version Zenā məssāleyāt za-ṭabib Fisaʾalgos (LIT4916PhysB)

Edition: Massimo Villa

ክፍል፡ ካልኣ፡ ዖፍ፡ ዘይሰመይ፡ ዘውእቱ፡ ዘይቤ፡ ጻዊት፡ በእንቲኣሁ፡ ይቤ፡ በእንቲኣሁ፡ እስመ፡ መፍቀሬ፡ ደቂቁ፡ ውእቱ፡ በሕቁ። ይወልድ፡ ወወለደያንሂ፡ በእንተዝ፡ እምዐቂበ፡ ውሉዶሙ፡ እስከ፡ ውሉድ። ባሕቱ፡ ዕለት፡ ትመጽኣ፡ እሞሙ፡ ደመ፡ ገቦሃ፡ መልዕልተ፡ ውሉዳ፡ እለ፡ ሞቱ፡ ወሶኑ፡ ውዱቃነ፡ ጲስ፡ ምድር፡ ወታነሥኦሙ። ምሳሌ፡ ዝንቱሰ፡ ነገር፡ ተፈጸመ፡ በእግዚእነ፡ ክርስቶስ፡ በከመ፡ ይቤ፡ ኢሳይያስ፡ ነቢይ፡ ውሉደ፡ ወለደኩ፡ ወአልዐቁ፡ እመንቱ፡ ዐለዉኒ። ህየንተ፡ ለነ፡ ወእምጽኡ፡ ኩሉ፡ ወንሕስሰ፡ ጎደግነ፡ እኪተ፡ ወጸፋዕነ፡ እስከ፡ ዐርጉ፡ ዕፀ፡ መስቀል፡ ወተረግዘ፡ ገቦሁ፡ ለነ፡ ደመ፡ ውማየ፡ ስርየት።

contents and physical description for each unit



direct link to each text, placement, clickable text

continues…

(you have seen this and the following slide on Monday)

Paris, Bibliothèque nationale de France, BnF Éthiopien 165

Edited by Dorothea Reule

Stub
Paris, Bibliothèque nationale de France
Collection: Manuscrits orientaux Fonds éthiopien

Other identifiers: Éth. 127

Item Navigation

Navigate section

General
Description
Physical desc of ms
- Codicological unit 1
- Codicological unit 2
- Codicological unit 3
- Codicological unit 4
- Codicological unit 5
- Codicological unit 6

Catalogue
Authors
Show more links

Dated

General description

Hide/show codicological information | Hide/show contents

Fragments of chants, Exodus, the Pauline Epistles, Prayers, Wəddāse Māryām

Number of Text units: 11

Number of Codicological units: 6

Form of support
Codex

Extent
29 (leaf).

Codicological Unit 1

Origin of codicological unit 1
Before 1877

Contents

Fragment of a chant book for feasts (?) / Item p1_i1

ff. 1-6 Fragment of a chant book for feasts (Dəggʷā = CAe 3178 (work)?)
Language of text: Gəʿəz

Catalogue Bibliography of codicological unit 1

- Zotenberg, H. 1877. *Catalogue des manuscrits éthiopiens (gheez et amharique) de la Bibliothèque nationale*, Manuscrits Orientaux (Paris: Imprimerie nationale, 1877), page 265b–266a.

Summary of codicological unit 1

Extracted summary of contents | Given summary of contents

p1_i1 (ff. 1-6), Fragment of a chant book for feasts (Dəggʷā = CAe 3178 (work)?)

Extent of codicological unit 1
6 (leaf).

Physical description of codicological unit 1

Outer dimension of codicological unit 1
H: 215mm x W: 165mm

(proportion height/width: 1.303)

Hand
Ethiopic Before 1877

Codicological Unit 2

Origin of codicological unit 2
Before 1877

Contents

Exodus 20:12-21 / Item p2_i1

f. 7 Exodus 20:12-21 (Exodus = CAe 1367)
Language of text: Gəʿəz

Catalogue Bibliography of codicological unit 2

Summary of codicological unit 2

Extracted summary of contents | Given summary of contents

p2_i1 (f. 7), Exodus 20:12-21 (Exodus = CAe 1367)

Extent of codicological unit 2
1 (leaf).

Physical description of codicological unit 2

Outer dimension of codicological unit 2
H: 230mm x W: 152mm

Universität Hamburg
DER FORSCHUNG | DER LEHRE | DER BILDUNG

AKADEMIE DER WISSENSCHAFTEN IN HAMBURG

Beta maṣāḥəft

Home | Clavis | Manuscripts | Places | Persons | Resources | ACHTUNG! | new issue | search | Search +

Entry | TEI/XML | Graph | Relations | Transcription

Paris, Bibliothèque nationale de France, BnF Éthiopien 165

Edited by Dorothea Reule

Stub
Paris, Bibliothèque nationale de France

Collection: Manuscrits orientaux Fonds éthiopien

Other identifiers: Éth. 127

Item Navigation

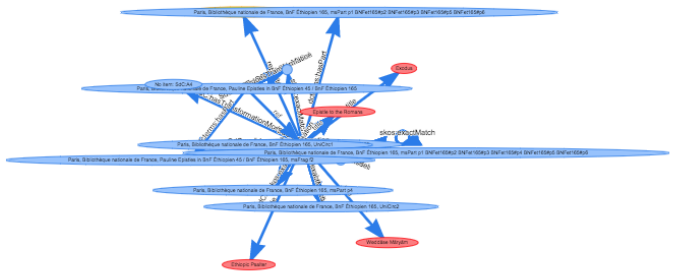
Navigate section

General
Description
Physical desc of ms
- Codicological unit 1
- Codicological unit 2
- Codicological unit 3
- Codicological unit 4
- Codicological unit 5
- Codicological unit 6

Catalogue
Authors
Show more links

Cluster outliers | Cluster by hubsize

graph view taken directly from TEI



All dates available in the record

Subject	Relation	Object	Description
Paris, Bibliothèque nationale de France, BnF Éthiopien 165, UniCirc1	dcterms:hasPart	Paris, Bibliothèque nationale de France, BnF Éthiopien 165, msPart p1Paris, Bibliothèque nationale de France, BnF Éthiopien 165, msPart p2Paris, Bibliothèque nationale de France, BnF Éthiopien 165, msPart p3Paris, Bibliothèque nationale de France, BnF Éthiopien 165, msPart p5Paris, Bibliothèque nationale de France, BnF Éthiopien 165, msPart p6	
Paris, Bibliothèque nationale de France, BnF Éthiopien 165, UniCirc1	SdC:undergoesTransformation	Paris, Bibliothèque nationale de France, BnF Éthiopien 165, transformation tr1	
Paris, Bibliothèque nationale de France, BnF Éthiopien 165, msPart p4	SdC:undergoesTransformation	Paris, Bibliothèque nationale de France, BnF Éthiopien 165, transformation tr1	
Paris, Bibliothèque nationale de France, BnF Éthiopien 165, transformation tr1	SdC:hasTransformationModel	La Synthaxe du Codex A4	
Paris, Bibliothèque nationale de France, BnF Éthiopien 165, transformation tr1	skos:exactMatch	Paris, Bibliothèque nationale de France, Pauline Epistles in BnF Éthiopien 45 / BnF Éthiopien 165, transformation tr2	
Paris, Bibliothèque nationale de France, BnF Éthiopien 165, transformation tr1	SdC:produces	Paris, Bibliothèque nationale de France, BnF Éthiopien 165, UniCirc2	
Paris, Bibliothèque nationale de	dcterms:hasPart	Paris, Bibliothèque nationale de France, BnF Éthiopien 165, msPart p1Paris, Bibliothèque nationale de France, BnF Éthiopien 165, msPart p2Paris, Bibliothèque	

explicitly stated relations

B. Beta maṣāḥəft and *La Syntaxe du Codex*

XML
XQuery
Graphs
RDF
SPARQL
AHEAD!!

Starting needs

- Encode that something happened rather than something can be observed
- This part is later than this other part
- The quire was added inside this quire later
- This part of manuscript comes from another manuscript
- This manuscripts is made of several pieces of other manuscripts
- etc.

"mettre en relation ces éléments pour comprendre comment le codex '*tient ensemble*' et se modifie avec le temps"
(Andrist, Canart, and Maniaci 2013, 9)

Steps

1. decide on the workflow
2. translate *La Syntaxe* to a formal ontology
3. produce annotations from manuscript descriptions in TEI using the entities and relations in the ontology
4. visualise the annotations as suggested in *La Syntaxe*
5. *Examples TEI to Visualization and back again*

Principles

- The technology should support
  - speed
  - laziness
  - collaboration
  - complexity
  - I do not know
  - data not available
  - I do not want to say
  - maybe…
- The data models and standard used should support **diversified input over time** (i.e. quite often and as a default **incomplete data, sometimes even erroneous**)
- The logic and **scripts** should make as **little assumptions** as possible at each stage and if they do make assumptions those should be stupid enough not to generate clever mistakes
- Needs to be reusable, based on **widely used and supported standards** and using technologies which are as **software independent** as possible.
- Publishing and using Linked Open Data means we can do thing with other data which we do not yet know. And they can do with our data things we do not yet know. **We are making connections we do not even know about**.

1. Workflow - La Syntaxe du Codex

STEP 1 = **List discontinuities (observation)**

- Add to a flat **list**

- Draw a **table** where converging discontinuities (*discontinuités convergentes*) can become visible

Data from observation can be encoded in TEI and used to produce the table

OR Data in TEI can be transformed to RDF to produce the table from that format

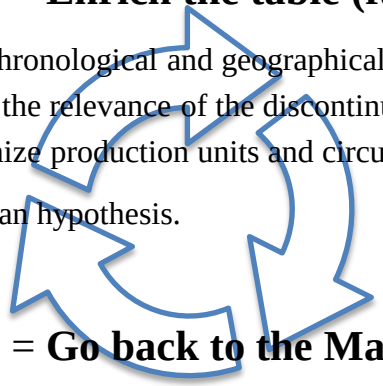
STEP 2 = **Enrich the table (further research)**

with chronological and geographical information in order to verify the relevance of the discontinuities and consequently recognize production units and circulation units (see below).

Make an hypothesis.

Data can be encoded in TEI and used to enrich the table

The hypothesis on the identifications of UniProd and UniCirc and their **relations** are much better represented by a graph, as in the book, so RDF.



STEP 3 = **Go back to the Manuscript**

check theoretical results and hypothesis with archeological analysis

To be able to iterate the process in one workflow I need to encode in TEI the relations

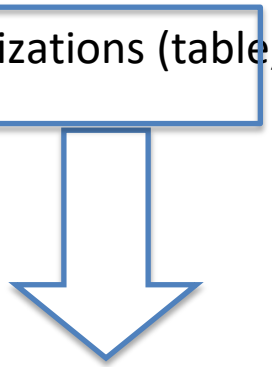
1. Workflow - La Syntaxe du Codex

Enter observations and hypothesis in TEI → Convert it all to RDF → produce visualisations

STEP 1 : the cataloguer encodes in TEI both description and hypotheses

STEP 2 : the cataloguer checks visualizations (table, graphs)

STEP 3 : verifying, good if there are images linked in the table

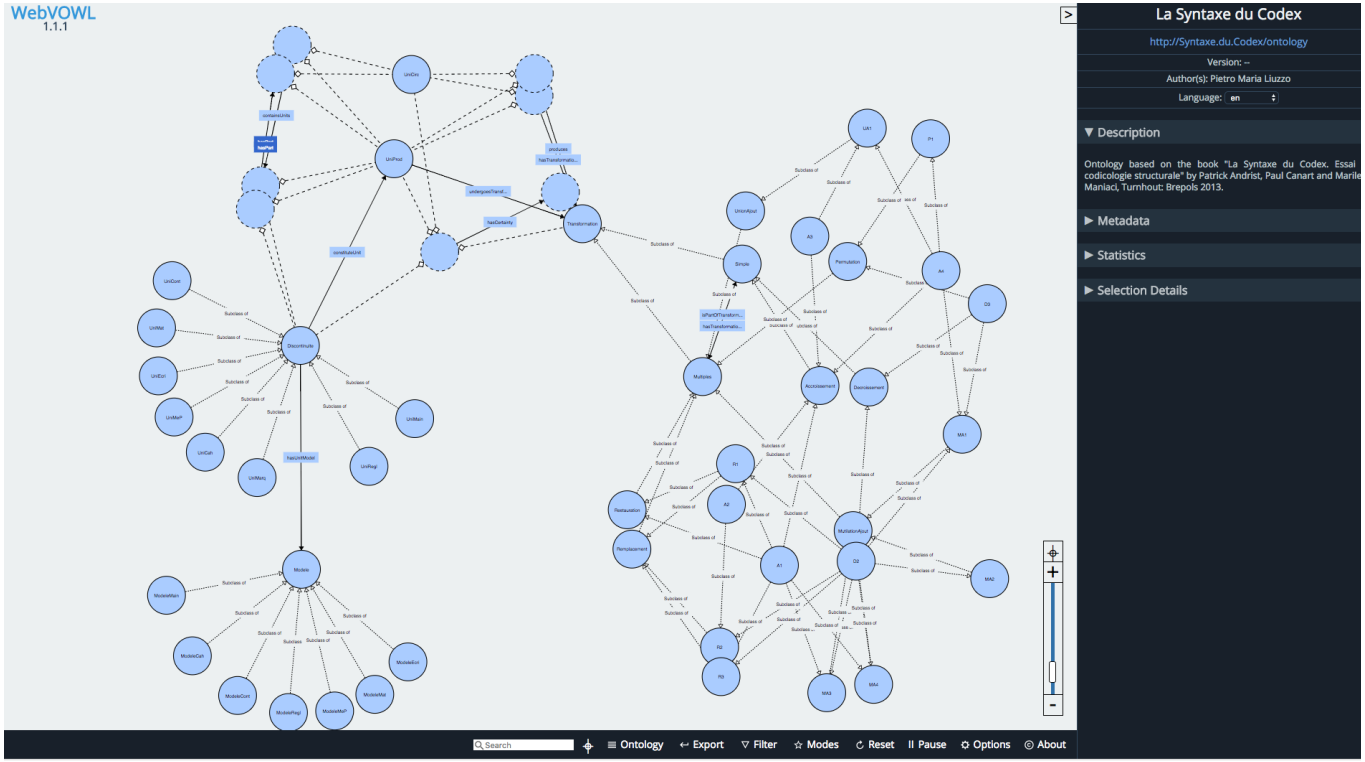


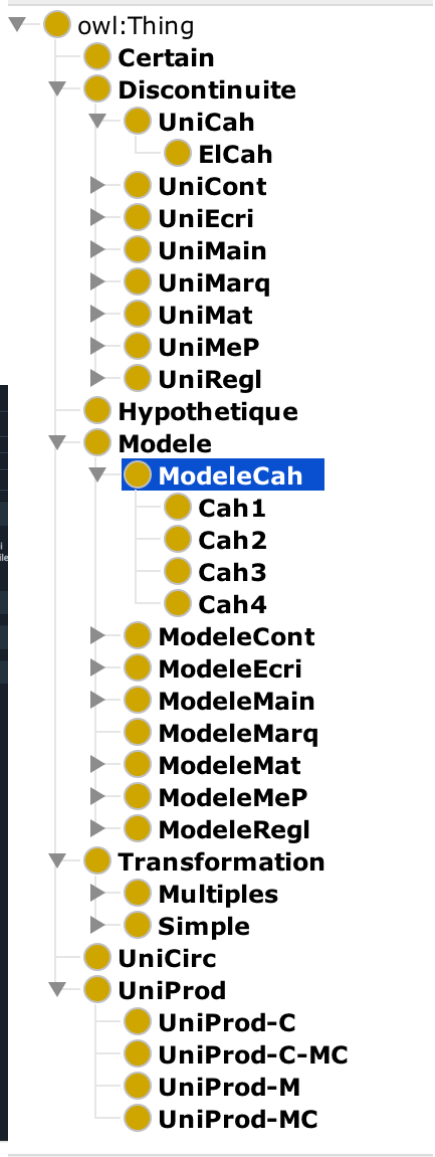
These are produced from the RDF!

- one could produce the same RDF and make the same visualisations using data from a db and not TEI
- the RDF can be reused for many other applications

2. La Syntaxe du Codex as Ontology in OWL

- declare a class for each Unit type and transformation
- declare relations between them
- already all done in the book!

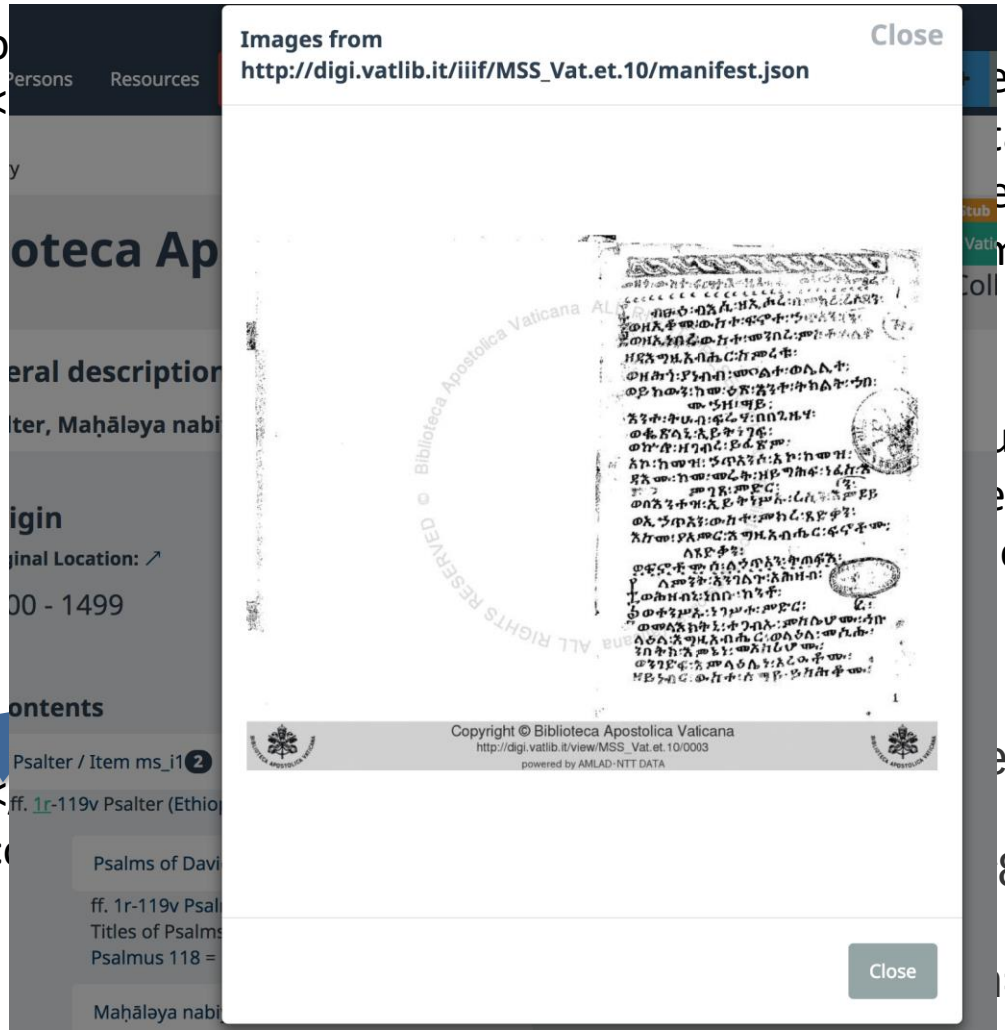




3. Using TEI to encode structural analysis

- there are elements which could be taken one to one to describe a Unit: <layoutNote> = UniMep or <handNote> = UniMain
- UniMat might already be different, as the material of a part is usually indicated inside <support> which is nested in the <physDesc>, so could have a different scope
- UniProd and UniCirc can be assigned looking at the TEI programmatically only in very few cases, e.g. the ms being described is always a UniCirc.
- mapping element name to Unit is impossible, as e.g. we use <item> both to list additions (UniCont), quires (UniCah) and foliation (UniMarq)
- transformation and their types are nowhere to be encoded

3. Using TEI to encode structural analysis - <locus>



<co
<
</c

essential to be able to produce
tabulation as in the book that
e are indications of placement in
manuscript

us/> is used in BM also to express
exact folia and the lines, as well
e corresponding facsimile.

et="#28v #33r #49r #50v #55v

83r #83v #84v #85r"/>

="31" facs="f62"/>

3. TEI to RDF - xml:id structure

To be able to assign URIs dynamically and build a graph, the IDs in the TEI file need to be stable and semantically recognisable.

Element	ID pattern
msPart	p\d+[\.\d+]+
msItem	p\d+[\.\d+]+_i\d+[\.\d+]+
binding decoNote	b\d+
decoNote	d\d+
addition	a\d+
extra	e\d+
quire	q\d+
foliation unit	fol\d+
hand	h\d+
title	t\d+
name	n\d+
edition	ed\d+
transformation	tr\d+
Uni\w+ (SdC)	Uni\w+\d+ (SdC)

3. TEI to RDF - URIs

For example in *Beta maṣāḥəft* encoding of Vatican City, Biblioteca Apostolica Vaticana, Aeth. 1 and the Gospel of Luke (CAe 2713)

- The Gospel of Luke as an abstract and organized intellectual product (**œuvre**) is the entity http://betamasaheft.eu/LIT2713Luke
- The Biblioteca Apostolica Vaticana Ethiopic Manuscript 1 is a manuscript, the entity http://betamasaheft.eu/BAVet1
- The Gospel of Luke in the above manuscript is the entity http://betamasaheft.eu/BAVet1/msitem/ms_i1.4.2
- The Calendaric note on folio 219r is the entity http://betamasaheft.eu/BAVet1/addition/a3
- Additionally, each of these is assigned to a class (and it can be added to as many as one wishes)
- http://betamasaheft.eu/LIT2713Luke is an instance in the class http://lawd.info/ontology/ConceptualWork
- http://betamasaheft.eu/BAVet1 is an instance in the class http://lawd.info/ontology/AssembledWork
- http://betamasaheft.eu/BAVet1/msitem/ms_i1.4.2 is an instance in the class http://betamasaheft.eu/msitem and might be an instance in the class UniCont
- http://betamasaheft.eu/BAVet1/addition/a3 is an instance in the class http://betamasaheft.eu/addition and might be an instance in the class UniCont

3. TEI to RDF - <relation>

<relation>

Home
C Elements

<relation> (relationship) describes any kind of relationship or linkage amongst a specified group of places, events, persons, objects or other items. [13.3.2.3 Personal Relationships]

Module	namesdates — Names, Dates, People, and Places
Attributes	att.global (@xml:id, @n, @xml:lang, @xml:base, @xml:space) (att.global.rendition (@rend, @style, @rendition)) (att.global.linking (@corresp, @synch, @sameAs, @copyOf, @next, @prev, @exclude, @select)) (att.global.analytic (@ana)) (att.global.facs (@facs)) (att.global.change (@change)) (att.global.responsibility (@cert, @resp)) (att.global.source (@source)) att.datable (@calendar, @notAfter, @from, @to)) (att.datable.iso (@when-iso, @notBefore-iso, @notAfter-iso, @notBefore-custom, @notAfter-custom, @from-custom, @to-custom, @datingPo (@key, @ref) att.sortable (@sortKey) att.typed (@type, @subtype)

@name supplies a name for the kind of relationship of which this is

Status Optional

Datatype teidata.enumerated

@active identifies the 'active' participants in a non-mutual relationship, or all the participants in a mutual one.

Status Optional

Datatype 1–∞ occurrences of teidata.pointer separated by whitespace

@mutual supplies a list of participants amongst all of whom the relationship holds equally.

Status Optional

Datatype 1–∞ occurrences of teidata.pointer separated by whitespace

@passive identifies the 'passive' participants in a non-mutual relationship.

Status Optional

http://betamasaheft.eu/BAVcerulli37/UniProd/UniProd1

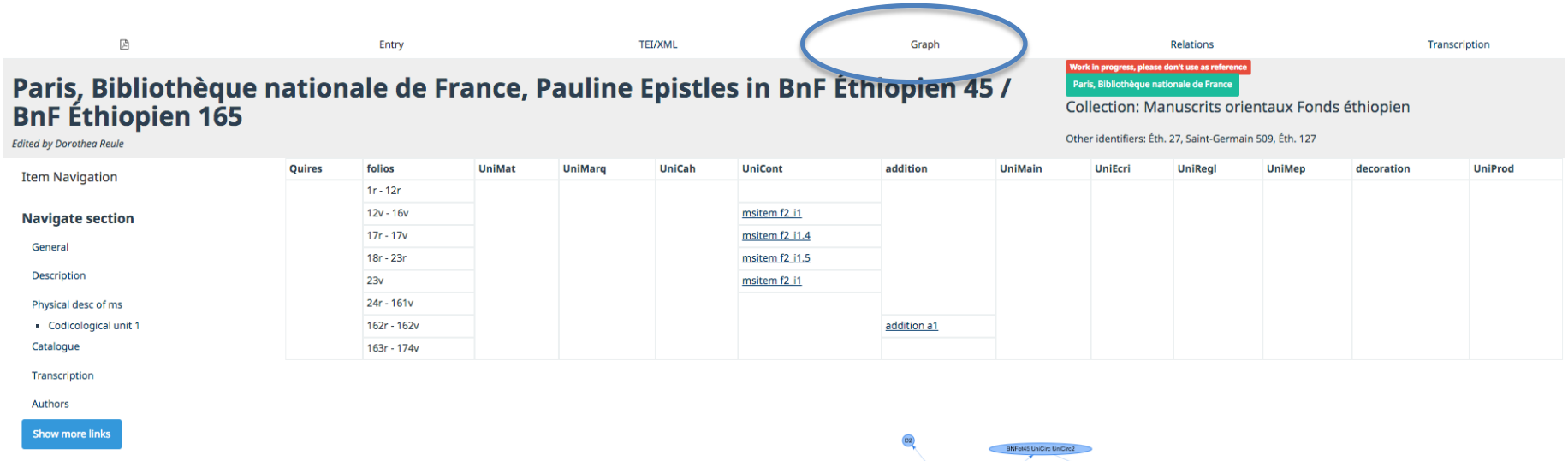
http://http://Synthax.du.Codex/ontology#constituteUnit

http://betamasaheft.eu/BAVcerulli37#p1

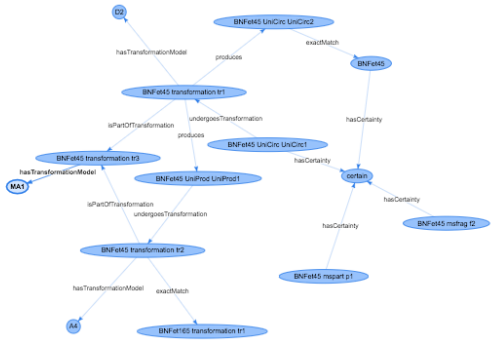
<relation
active="http://betamasaheft.eu/BAVcerulli37#p1"
name="http://http://Synthax.du.Codex/ontology#constituteUnit"
passive="http://betamasaheft.eu/BAVcerulli37/UniProd/UniProd1"/>

<relation
active="BAVcerulli37#p1"
name="SdC:constituteUnit"
passive="BAVcerulli37#UniProd1"/>

4. Visualizing the RDF



Some of the informations are extracted from the TEI encoding, some others need to be stated in relation elements.



the visualization is part of the workflow and needs to:

- dynamically update as more content is added
- be available also when some data is lacking

4. Visualizing the RDF - Table of non concomitant discontinuities

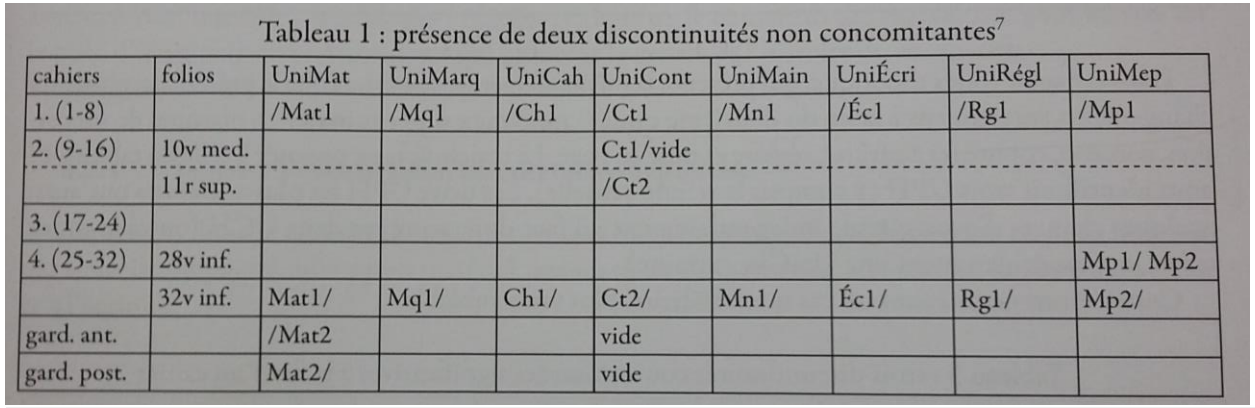


Tableau 1 : présence de deux discontinuités non concomitantes[7]

cahiers	folios	UniMat	UniMarq	UniCah	UniCont	UniMain	UniÉcri	UniRégl	UniMep
1. (1-8)		/Mat1	/Mq1	/Ch1	/Ct1	/Mn1	/Éc1	/Rg1	/Mp1
2. (9-16)	10v med.				Ct1/vide				
	11r sup.				/Ct2				
3. (17-24)									
4. (25-32)	28v inf.								Mp1/ Mp2
	32v inf.	Mat1/	Mq1/	Ch1/	Ct2/	Mn1/	Éc1/	Rg1/	Mp2/
gard. ant.		/Mat2			vide				
gard. post.		Mat2/			vide				

Quires	folios	UniMat	UniMarq	UniCah	UniCont	addition	UniMain	UniEcri	UniRegl	UniMep	decoration	UniProd
quire q1	1r					addition e1					decoration d3	
	1v											
quire q2	2r				msitem p1_i1.1		hand h1				decoration d1	
	2v - 9v											
quire q3	10r - 17v											
quire q4	18r - 20v											
	21r - 21v											
quire q5	22r - 30v				msitem p2_i1.2		hand h2					
quire q6	31r - 36v											
quire q7	37r - 43v											
quire q8	44r - 56v											
quire q9	57r - 60v											
quire q10	61r - 67v											
quire q11	68r - 73v											
quire q12	74r - 79r											
	79v											
quire q13	80r				msitem p1_i2		hand h1				decoration d2	
	80v - 83r											
	83v											
	84r										decoration d3	
	84v											

- there are no bars like in /Mat1, Mat1/ because the exact column and line can be indicated
- Quires are treated the same way as other units. Actually only 10% of the descriptions in BM have a collation
- no display yet for guards and binding data
- sometimes the grouping of the rows goes wrong

4. Visualizing the RDF - Enriched Table

click the Enrich button and some data is picked up from the TEI and sticked into the table

Enrich Table

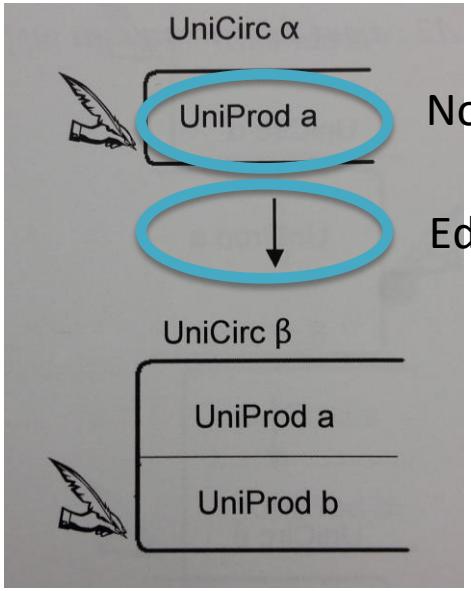
Quires	folios	UniMat	UniMarq	UniCah	UniCont	addition	UniMain	UniEcri	UniRegl	UniMep	decoration	UniProd
	1r					addition e1	hand h1					
	1v - 94r				msitem ms_i1.1							
	94v - 95r				msitem ms_i1.2.1							
	95v - 97v				msitem ms_i1.2.2							
	98r - 98v				msitem ms_i1.2.3							
	99r - 103r				msitem ms_i1.2							
	103v - 105v				msitem ms_i1.2.11							
	106r - 106v				msitem ms_i1.2							
	107r - 112v				msitem ms_i1.3							
	113r - 113v											

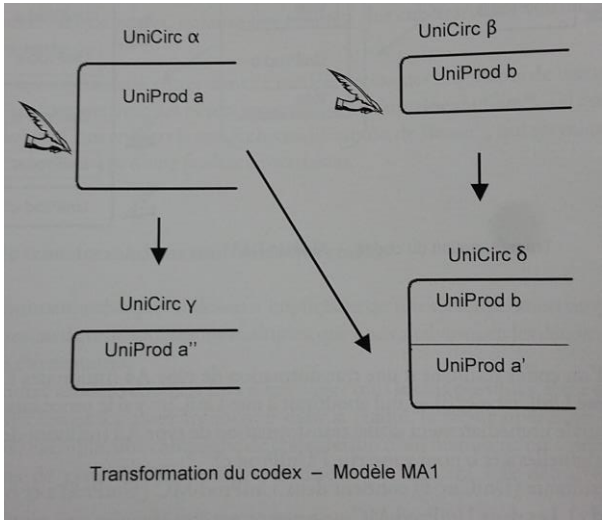
Enrich Table

Quires	folios	UniMat	UniMarq	UniCah	UniCont	addition	UniMain	UniEcri	UniRegl	UniMep	decoration
	1r					addition e1 **elementName** item **note** The French words ; X; e; siècle; are written in a recent hand. **id** e1	hand h1 **elementName** handNote **id** h1				
	1v - 94r				msitem ms_i1.1 **elementName** msItem **note** **title** Psalms of David **links** Named Entities: Psalms of David | Terms: | References: **id** ms_i1.1						

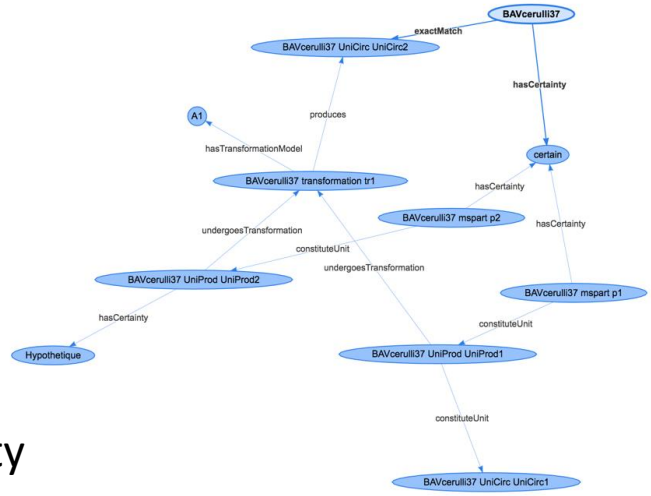
4. Visualizing the RDF- Transformation models

Transformation models





there is a property which connects UniCirc and UniProd Classes as Domain and Range

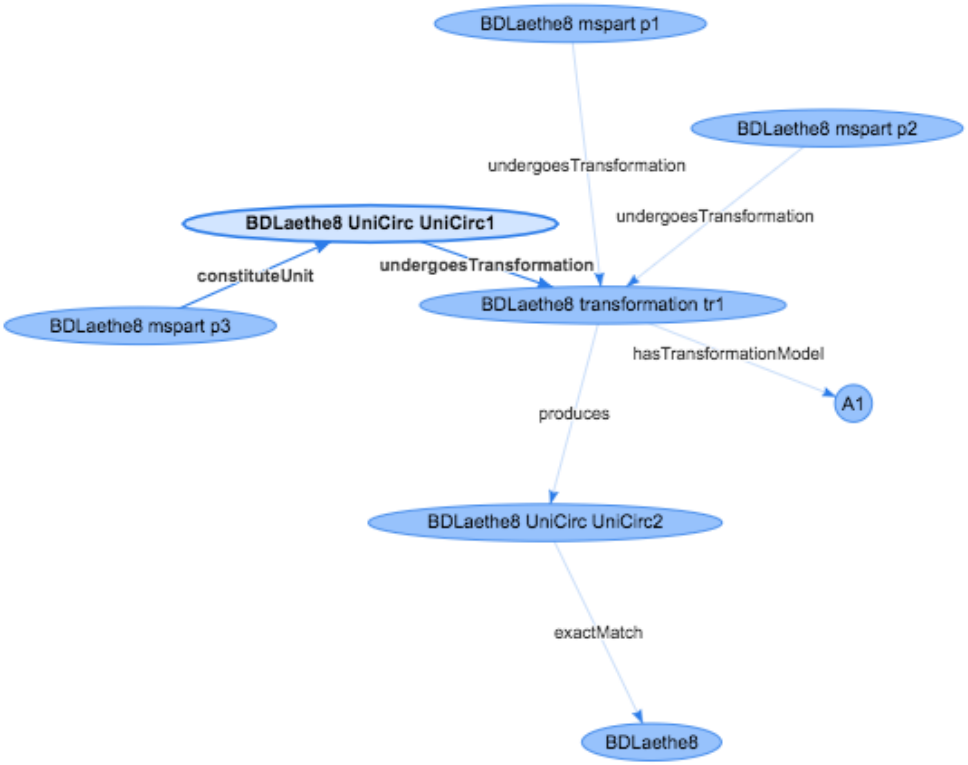


Real world instances of the example

5. Example 1- Oxford, Bodleian Library, Bodleian Aeth. e. 8

none of the three <msPart> has an internal date and the dating is in general uncertain, but we know that <msPart> 1 and 2 were added later to the manuscript.

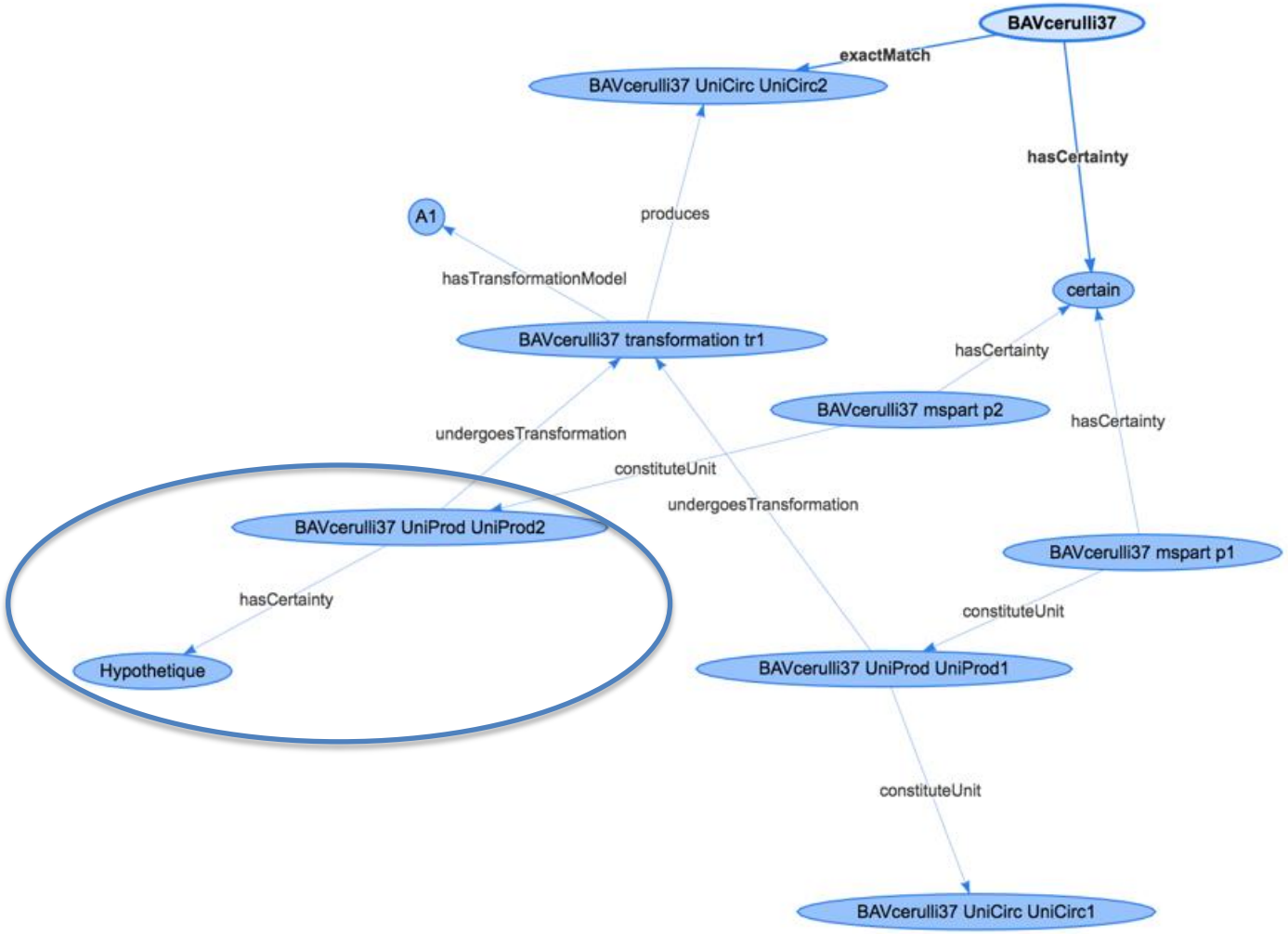
```
<listRelation>
  <relation
        active="BDLaethe8#p3"
        name="SdC:constituteUnit"
        passive="BDLaethe8#UniCirc1"/>
  <relation
        active="BDLaethe8#p3"
        name="SdC:undergoesTransformation"
        passive="BDLaethe8#tr1"/>
  <relation
        active="BDLaethe8#p1"
        name="SdC:undergoesTransformation"
        passive="BDLaethe8#tr1"/>
  <relation
        active="BDLaethe8#p2"
        name="SdC:undergoesTransformation"
        passive="BDLaethe8#tr1"/>
  <relation
```




```
    <skos:exactMatch rdf:resource="http://betamasaheft.eu/BDLaethe8"/>
  </rdf:Description>
```

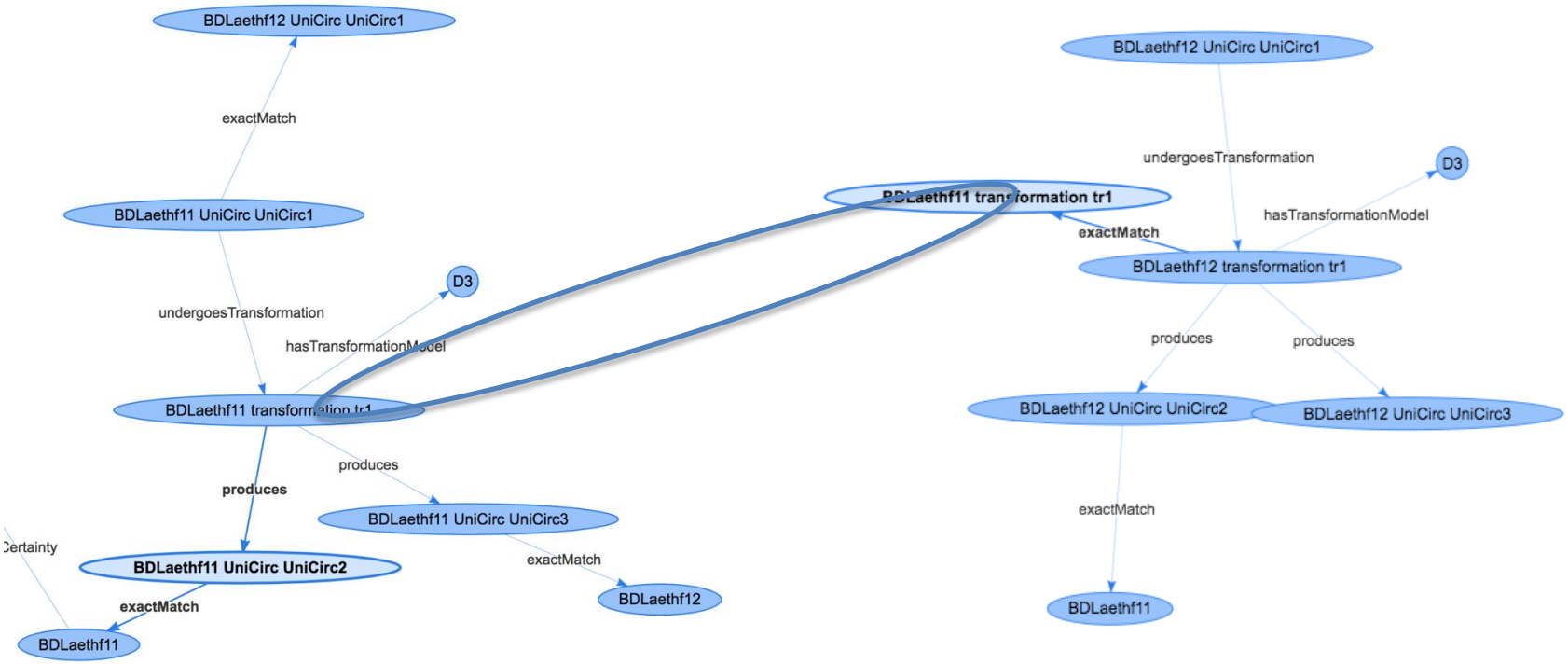
5. Example 2 - Vatican City, Biblioteca Apostolica Vaticana, Cerulli 37

a manuscript part has probably been added to the manuscript



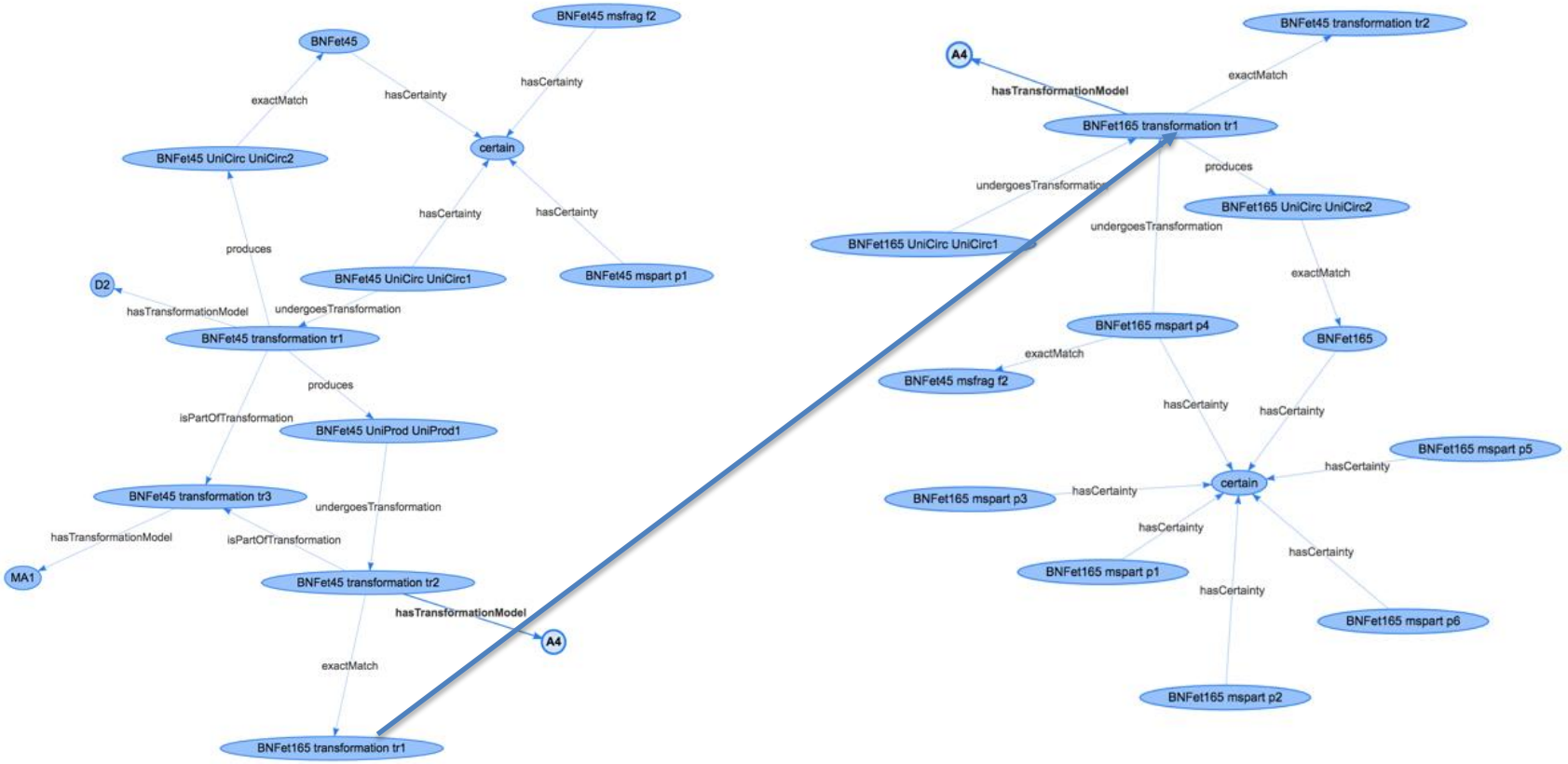
5. Example 3 - - Oxford, Bodleian Library, Bodleian Aeth. f. 11 (R) and Oxford, Bodleian Library, Bodleian Aeth. f. 12 (R)

both are scrolls containing magic prayers which belonged to the same owner and writes at the end of his description of Oxford, Bodleian Library, Bodleian Aeth. f. 11, "Continuation in no. 91" where n.91 is Oxford, Bodleian Library, Bodleian Aeth. f. 12. The research team has discussed this and convened that the two scrolls where once one.



5. Example 4 - Paris, Bibliothèque nationale de France, BnF Éthiopien 45 and Paris, Bibliothèque nationale de France, BnF Éthiopien 165

Paris, Bibliothèque nationale de France, BnF Éthiopien 45 (BNFet165) **contains leaves detached from** Paris, Bibliothèque nationale de France, BnF Éthiopien 45 (BNFet45)



C. Additional benefits and further potential of Linked Open Data

Further potential of the RDF data - Query data about a UniCirc

```
SELECT DISTINCT *
WHERE
{bm:BAVcerulli37 a SdC:UniCirc ;
 dcterms:hasPart ?msPart .
?msPart a SdC:UniProd .}
```

MsPart
http://betamasaheft.eu/BAVcerulli37/mspart/p1
http://betamasaheft.eu/BAVcerulli37/mspart/p2

```
SELECT DISTINCT *
WHERE
{bm:BAVcerulli37/UniCirc/UniCirc1 a SdC:UniCirc ;
dcterms:hasPart ?msPart .
?msPart a SdC:UniProd .}
```

MsPart
http://betamasaheft.eu/BAVcerulli37/mspart/p1

```
SELECT DISTINCT *
WHERE
{bm:BAVcerulli37/UniCirc/UniCirc2 a SdC:UniCirc ;
dcterms:hasPart ?msPart .
?msPart a SdC:UniProd .}
```

MsPart
http://betamasaheft.eu/BAVcerulli37/mspart/p1
http://betamasaheft.eu/BAVcerulli37/mspart/p2

I can ask about any UniCirc using the same query, no subordinate entities

Further potential of the RDF data - Query data about a UniCirc

which manuscripts have parts which have undergone some change?

```
SELECT DISTINCT *
WHERE
{?AnyUniCirc a SdC:UniCirc ;
 dcterms:hasPart ?AnyUniProd .
?AnyUniProd a SdC:UniProd ;
SdC:constituteUnit ?UniProdID .
?UniProdID SdC:undergoesTransformation ?AnyTransformation .
?AnyTransformation SdC:hasTransformationModel ?model
} LIMIT 25
```

AnyUniCirc	AnyUniProd	UniProdID	AnyTransformation	Model
http://betamasaheft.eu/BAVcerulli37	http://betamasaheft.eu/BAVcerulli37/mspart/p1	http://betamasaheft.eu/BAVcerulli37/UniProd/UniProd1	http://betamasaheft.eu/BAVcerulli37/transformation/tr1	http://Syntaxe.du.Codex/ontology#A1
http://betamasaheft.eu/BAVcerulli37	http://betamasaheft.eu/BAVcerulli37/mspart/p2	http://betamasaheft.eu/BAVcerulli37/UniProd/UniProd2	http://betamasaheft.eu/BAVcerulli37/transformation/tr1	http://Syntaxe.du.Codex/ontology#A1
http://betamasaheft.eu/BDLaethe8	http://betamasaheft.eu/BDLaethe8/mspart/p3	http://betamasaheft.eu/BDLaethe8/UniCirc/UniCirc1	http://betamasaheft.eu/BDLaethe8/transformation/tr1	http://Syntaxe.du.Codex/ontology#A1
http://betamasaheft.eu/BAVcerulli37/UniCirc/UniCirc1	http://betamasaheft.eu/BAVcerulli37/mspart/p1	http://betamasaheft.eu/BAVcerulli37/UniProd/UniProd1	http://betamasaheft.eu/BAVcerulli37/transformation/tr1	http://Syntaxe.du.Codex/ontology#A1
http://betamasaheft.eu/BAVcerulli37/UniCirc/UniCirc2	http://betamasaheft.eu/BAVcerulli37/mspart/p1	http://betamasaheft.eu/BAVcerulli37/UniProd/UniProd1	http://betamasaheft.eu/BAVcerulli37/transformation/tr1	http://Syntaxe.du.Codex/ontology#A1
http://betamasaheft.eu/BAVcerulli37/UniCirc/UniCirc2	http://betamasaheft.eu/BAVcerulli37/mspart/p2	http://betamasaheft.eu/BAVcerulli37/UniProd/UniProd2	http://betamasaheft.eu/BAVcerulli37/transformation/tr1	http://Syntaxe.du.Codex/ontology#A1

I can ask about all UniCirc then filter by, e.g. date, or material, etc.
because BAVcerulli37, is actually the same as BAVcerulli37/UniCirc/UniCirc2,
we could filter out those which have a skos:exactMatch relation

Further potential of the RDF data - Query data about a UniCirc

which UniCirc have the same ModelCah?

XQuery the TEI?
I could get all those which have a collation whose item always have the same number of leaves….

```
collection(/location/of/TEI)//collation[count(distinct-values(descendant::item/dim[@unit='leaf'])) = 1]
```

in BM: 56 out of 1287 which have any collation information at all.

or I could, e.g., tabulate all collations making a CSV

```
for $collation in collection($config:data-rootMS)//t:collation[t:list]
let $msID := string($collation/ancestor::t:TEI/@xml:id)
let $repoID := string($collation/ancestor::t:TEI//t:repository/@ref)
let $NumberOfQuires := count($collation//t:item)
let $QuireSizes := for $quire in $collation//t:item return $quire/t:dim[@unit='leaf']/text()
let $quiresizesstring := string-join($QuireSizes, '|')
order by $NumberOfQuires
return
$repoID || ', '|| $msID ||", "||$NumberOfQuires||', ' || $quiresizesstring
```

INS0129DMD	ESdmd003	1	
INS0178QMM	ESqmm013	2	8|8
INS0165DSM	ESdsm021b	2	2|10
INS0039MY	ESmy026a	2	8|8
INS0039MY	ESmy023	2	3|9
INS0131DMB	ESdmb007	2	8|2
INS0017UM	ESum035	2	7|4
INS0317Frank	FSUor16	2	8|3
INS0314ONB	ONBAeth4	2	8|8
INS0003BAV	BAVet53	2	8|8
INS0198QS	ESqs016	2	12|6
INS0159QQM	ESqqm021	2	6|6
INS0034DZ	ESdz003	3	1|8|8
INS0071FBM	ESfbm007	3	2|10|11
INS0093AGM	ESagm009	3	11|10|10
INS0119MQM	ESmqm019	3	2|10|10
INS0111SSB	ESssb017a	3	4|4|2
INS0097AQG	ESaqg016	3	6|6|8
INS0003BAV	BAVet41	3	10|10|1
INS0133QMB	ESqmb007	3	2|10|12
INS0108GKM	ESgkm020	3	4|8|6
INS0198QS	ESqs011	3	3|8|6
INS0105DD	ESdd046	3	7|6|3
INS0144MHG	ESmhg006	4	2|10|2|6
INS0177SDM	ESsdm023	4	10|10|10|8
INS0103AKM	ESakm007	4	7|8|9|7
INS0042MR	ESmr006	4	6|1|6|4
INS0030AP	ESap013	4	1|1|7|9
INS0196WQ	ESwq006	4	9|8|8|10

but one could get already to the filtered result…

Further potential of the RDF data - Query data about a UniCirc

which UniCirc have the same ModelCah?

```
<relation
   active="BAVcerulli37"
   name="SdC:hasUnitModel"
   passive="SdC:Cah1"
/>

SELECT DISTINCT *
WHERE
{
  ?Anything SdC:hasUnitModel SdC:Cah1.
}
```

in BM: 0 out of all, because nobody has yet added this kind of annotation.

Further potential of the RDF data - get summary information about transformations

what can ever happen to a manuscript sitting on a shelf?
Tell me about all transformations

```
SELECT *
WHERE {
?transformation a SdC:Transformation;
      SdC:produces ?UnitProduct;
      SdC:hasTransformationModel ?model .
}
```

Transformation	UnitProduct	Model
http://betamasaheft.eu/BNFet165/transformation/tr1	http://betamasaheft.eu/BNFet165/UniCirc/UniCirc2	http://Syntaxe.du.Codex/ontology#A4
http://betamasaheft.eu/BDLaethe8/transformation/tr1	http://betamasaheft.eu/BDLaethe8/UniCirc/UniCirc2	http://Syntaxe.du.Codex/ontology#A1
http://betamasaheft.eu/BNFet45/transformation/tr1	http://betamasaheft.eu/BNFet45/UniProd/UniProd1	http://Syntaxe.du.Codex/ontology#D2
http://betamasaheft.eu/BNFet45/transformation/tr1	http://betamasaheft.eu/BNFet45/UniCirc/UniCirc2	http://Syntaxe.du.Codex/ontology#D2
http://betamasaheft.eu/BDLaethf12/transformation/tr1	http://betamasaheft.eu/BDLaethf12/UniCirc/UniCirc2	http://Syntaxe.du.Codex/ontology#D3
http://betamasaheft.eu/BDLaethf12/transformation/tr1	http://betamasaheft.eu/BDLaethf12/UniCirc/UniCirc3	http://Syntaxe.du.Codex/ontology#D3
http://betamasaheft.eu/BDLaethf11/transformation/tr1	http://betamasaheft.eu/BDLaethf11/UniCirc/UniCirc2	http://Syntaxe.du.Codex/ontology#D3
http://betamasaheft.eu/BDLaethf11/transformation/tr1	http://betamasaheft.eu/BDLaethf11/UniCirc/UniCirc3	http://Syntaxe.du.Codex/ontology#D3
http://betamasaheft.eu/BAVcerulli37/transformation/tr1	http://betamasaheft.eu/BAVcerulli37/UniCirc/UniCirc2	http://Syntaxe.du.Codex/ontology#A1

As in any query, with any data model, to get further information the query will become more com

Further potential of the RDF data - get summary information about transformations

what has been subject to transformation? and of which?

```
SELECT DISTINCT ?AnyUnit ?type ?AnyTransformation ?model
WHERE
{?AnyUnit SdC:undergoesTransformation ?AnyTransformation ;
a ?type .
BIND(STR(?type) as ?t)
FILTER(strStarts(?t, 'http://Syntaxe.du.Codex/ontology#') )
?AnyTransformation SdC:hasTransformationModel ?model
} LIMIT 25
```

AnyUnit	Type	AnyTransformation	Model
http://betamasaheft.eu/BNFet165/UniCirc/UniCirc1	http://Syntaxe.du.Codex/ontology#UniCirc	http://betamasaheft.eu/BNFet165/transformation/tr1	http://Syntaxe.du.Codex/ontology#A4
http://betamasaheft.eu/BNFet165/mspart/p4	http://Syntaxe.du.Codex/ontology#UniProd	http://betamasaheft.eu/BNFet165/transformation/tr1	http://Syntaxe.du.Codex/ontology#A4
http://betamasaheft.eu/BNFet45/UniProd/UniProd1	http://Syntaxe.du.Codex/ontology#UniProd	http://betamasaheft.eu/BNFet45/transformation/tr2	http://Syntaxe.du.Codex/ontology#A4
http://betamasaheft.eu/BDLaethe8/mspart/p1	http://Syntaxe.du.Codex/ontology#UniProd	http://betamasaheft.eu/BDLaethe8/transformation/tr1	http://Syntaxe.du.Codex/ontology#A1
http://betamasaheft.eu/BDLaethe8/mspart/p2	http://Syntaxe.du.Codex/ontology#UniProd	http://betamasaheft.eu/BDLaethe8/transformation/tr1	http://Syntaxe.du.Codex/ontology#A1
http://betamasaheft.eu/BDLaethe8/UniCirc/UniCirc1	http://Syntaxe.du.Codex/ontology#UniCirc	http://betamasaheft.eu/BDLaethe8/transformation/tr1	http://Syntaxe.du.Codex/ontology#A1
http://betamasaheft.eu/BNFet45/UniCirc/UniCirc1	http://Syntaxe.du.Codex/ontology#UniCirc	http://betamasaheft.eu/BNFet45/transformation/tr1	http://Syntaxe.du.Codex/ontology#D2
http://betamasaheft.eu/BDLaethf12/UniCirc/UniCirc1	http://Syntaxe.du.Codex/ontology#UniCirc	http://betamasaheft.eu/BDLaethf12/transformation/tr1	http://Syntaxe.du.Codex/ontology#D3
http://betamasaheft.eu/BDLaethf11/UniCirc/UniCirc1	http://Syntaxe.du.Codex/ontology#UniCirc	http://betamasaheft.eu/BDLaethf11/transformation/tr1	http://Syntaxe.du.Codex/ontology#D3
http://betamasaheft.eu/BAVcerulli37/UniProd/UniProd2	http://Syntaxe.du.Codex/ontology#UniProd	http://betamasaheft.eu/BAVcerulli37/transformation/tr1	http://Syntaxe.du.Codex/ontology#A1
http://betamasaheft.eu/BAVcerulli37/UniProd/UniProd1	http://Syntaxe.du.Codex/ontology#UniProd	http://betamasaheft.eu/BAVcerulli37/transformation/tr1	http://Syntaxe.du.Codex/ontology#A1

One can get comparable results also if the statements are done slightly differently

Further potential of the RDF data - federated queries

```
SELECT *
WHERE
{
 {
      SERVICE <http://wwwb.library.vanderbilt.edu/exist/apps/srophe/api/sparql>
      {
      ?relatedID <http://purl.org/dc/terms/relation> <https://pleiades.stoa.org/places/6584
      }
 }
 UNION
 {
 ?relatedID <http://purl.org/dc/terms/relation> <https://pleiades.stoa.org/places/658457>.
 }
}
```

Available data can be joined for specific queries

Vielen Dank

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Universität Hamburg
DER FORSCHUNG | DER LEHRE | DER BILDUNG

AKADEMIE DER WISSENSCHAFTEN IN HAMBURG

Hiob Ludolf Zentrum für Äthiopistik

beta maṣāḥəft
Manuscripts of Ethiopia and Eritrea

Emergency Slides!

This is not finished, it is work in progress.

Can I reuse it?

Yes please!

https://github.com/BetaMasaheft

Can I contribute?

Yes please!

https://github.com/BetaMasaheft

http://betamasaheft.eu/Guidelines/

Why "not" CIDOC-CRM?

True. But:

You can construct your CIDOC on the fly with a CONSTRUCT query

```
CONSTRUCT
    {
?transformation a <http://www.cidoc-crm.org/cidoc-crm/E11_Modification> ;
                    <http://www.cidoc-crm.org/cidoc-crm/P31_has_modified> ?AnyUniCirc;
                    <http://www.cidoc-crm.org/cidoc-crm/P108_has_produced> ?AnyUni .
?AnyUniCirc a <http://www.cidoc-crm.org/cidoc-crm/E24_Physical_Man-Made_Thing>
    }
WHERE
    {
        ?AnyUniCirc a <http://Syntaxe.du.Codex/ontology#UniCirc>;
                    <http://Syntaxe.du.Codex/ontology#undergoesTransformation> ?transformation .
                ?transformation <http://Syntaxe.du.Codex/ontology#produces> ?AnyUni
    }
```

we use cidoc-crm/E11_Modification for each Transformation and so on, providing an internal mapping

With federated query, knowing what mapping you want to apply, results can be obtained any