Masterclass “Digital Scholarly Edition”
Saarbrücken, 19.–23.2.2024

CENTRE FOR
INFORMATION-MODELLING
AUSTRIAN CENTRE FOR
DIGITAL HUMANITIES

Introduction to publishing workflows in GAMS Graz

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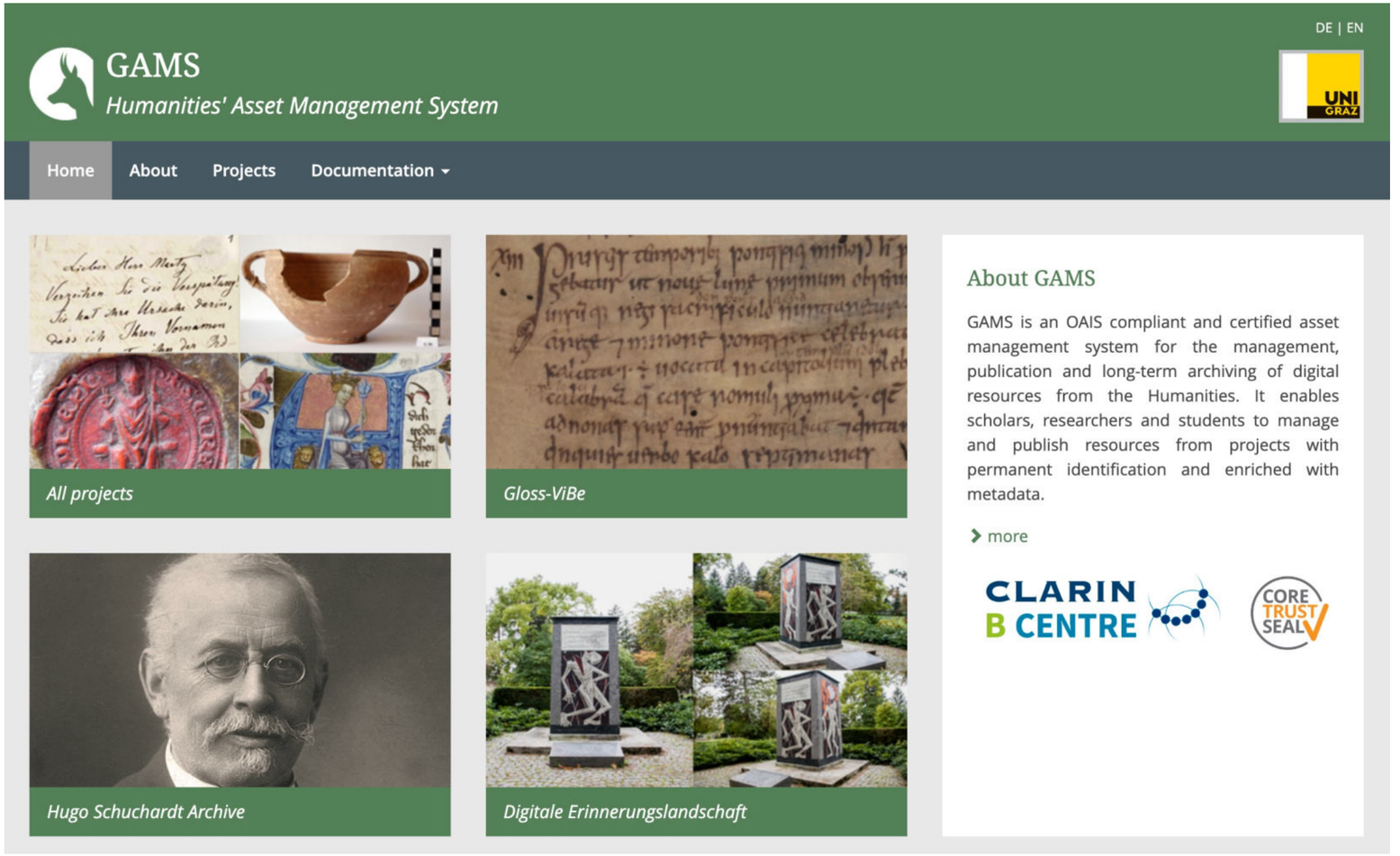
GAMS: An Infrastructure for Research Projects in the Digital Humanities

- Geisteswissenschaftliches Asset Management System
  (Asset Management System for the Humanities, https://gams.uni-graz.at)
- the acronym is the German word for ‘chamois’

GAMS: An Infrastructure for Research Projects in the Digital Humanities

- Not only a technical infrastructure, but a strategy
  - a repository for publication and long-term archiving of digital resources (from the humanities)
  - both a storage layer and a framework for sustainable application development
  - certified according to the criteria of the Data Seal of Approval
  - built on FEDORA: we use it since version 2.0 (2004) up to 3.5
  - further integral technologies: Blazegraph triplestore, Apache Cocoon, Apache Solr, Loris IIIF image server
  - persistent identification of objects using Handle System
  - based on the XML paradigm of strict separation of content and presentation

GAMS: An Infrastructure for Research Projects in the Digital Humanities



GAMS: An Infrastructure for Research Projects in the Digital Humanities

- Our projects range from Digital Scholarly Editions, to Image Collections and Language Corpora
- Digital objects are handled by one FEDORA instance
- In-house developed Java client for ingesting and managing large-scale digital object collections
- FEDORA allows to handle standardised, distributed workflows via Content Models

Content Models

- Structural definition for a “type” of digital object (e.g., manuscript, artifact, ontology, etc.)
- Class definition with
  - Predefined (but growable) set of data streams
  - Set of dissemination methods for the objects
- Workflows triggered during ingest or request of an object content/method
- Set of rules for creating a digital object

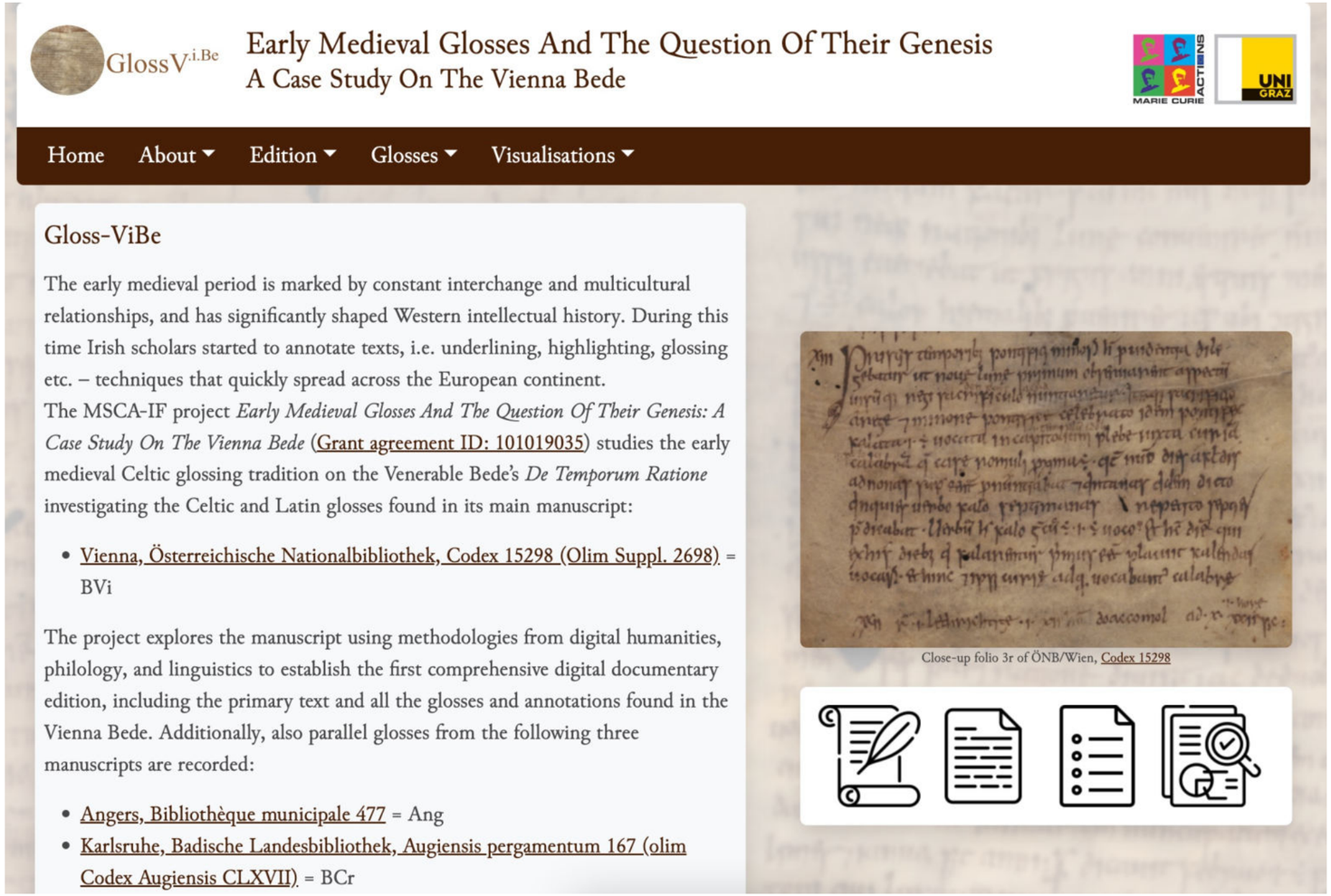
Content Models

- Incomplete list of

  - CMs supporting specific XML schemata
    - TEI
    - LIDO
    - MEI
    - METS
    - SKOS
    - OWL
  - CMs for aggregated content
    - Context
    - Query
    - R
  - CMs for static content
    - PDF
    - Resource

An example: Gloss-ViBe

https://gams.uni-graz.at/glossvibe



Gloss-ViBe

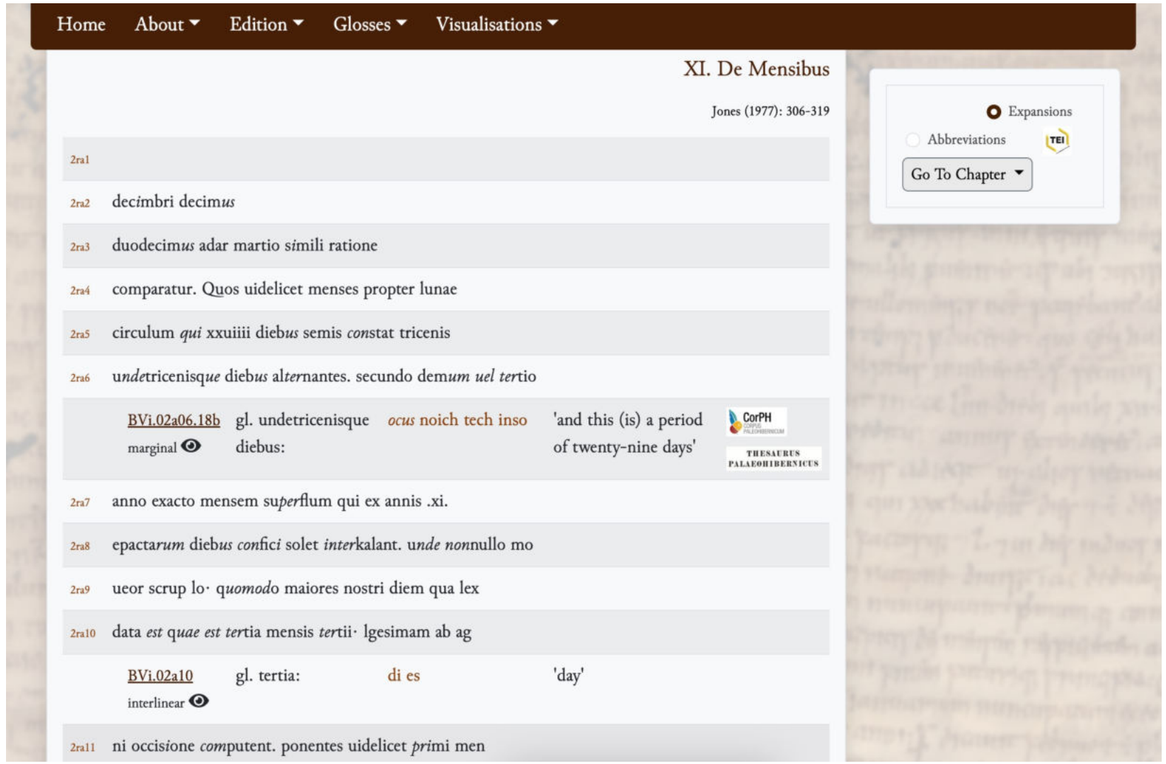
- Transcription of the manuscript using the TEI schema

- During the ingest of the TEI document:
  - Upload of facsimile of the manuscript
  - Extraction of RDF triples from the TEI document and storing in Blazegraph triplestore
  - Extraction of descriptive metadata
  - Creation of IIIF manifest based on the structure information

Gloss-ViBe: text representation

```
<pb facs="#IMAGE.1" n="fol. 1r" type="manuscript"/>
<cb facs="#facs_1_region_1624279312892_211" n="margin_left"/>
<pb ed="Jones" n="296" type="edition"/>
<div n="VII. De Nocte" type="chapter" xml:id="VII">
    <ab>
      <gloss facs="http://gams.uni-graz.at/iiif/o:glossvibe.bvi/IMAGE.1/153,538,128,189/full/0/default.jpg" ana="#sga" subtype="monolingual" target="#Jon_297_25a"
        <ref target="https://archive.org/details/thesauruspalaeoh02stokuoft/page/31/mode/1up" type="Thesaurus">Thes.ii.31.1a1.2</ref>
        <ref target="https://chronhib.maynoothuniversity.ie/chronhibWebsite/tables?page=0&amp;limit=0&amp;fprop=Text_Unit_ID&amp;fval=S0058-2&amp;dtable=morphology
        <ref target="https://digital.onb.ac.at/RepViewer/image?doc=DTL_8650790&amp;img=00000008.jpg&amp;hash=5af078d09f16827f232e850ab1bec13c59557c6cc26f19236e380
        <app>
          <lem>
            <lb facs="#facs_1_line_1626430349497_771"/><w lemma="is_1" msd="3pl.fut." pos="VERB" xml:id="BVi.01a09a.02.0">bi<supplied reason="Ink stain">it</suppli
            <lb facs="#facs_1_line_1626430353217_776"/>s<choice><expan>i</expan><abbr><am><g ref="#sub-i"/></am></abbr></choice></w> <w lemma="imm" msd="3pl." pos=
            <lb facs="#facs_1_line_1626430357354_781"/><w lemma="i" msd="dat." pos="ADP" xml:id="BVi.01a09a.02.3a">i</w><w lemma="in_1" msd="dat.sg.masc." pos="DET
            <lb facs="#facs_1_line_1626430360833_786"/><w lemma="in_1" msd="nom.sg.neut." pos="DET" xml:id="BVi.01a09a.02.5">in</w> <w lemma="sin" msd="nom.sg.neut
          </lem>
          <note target="#BVi.01a09a.02" type="translation">those will be alight around them in the air</note>
          <note target="#BVi.01a09a.02" type="glossing"><w lemma="circumpo" msd="nom.sg.fem.participle." pos="VERB" xml:id="glBVi.01a09a.02.0">circumposita</w></n
          <rdg facs="https://iiif.irht.cnrs.fr/iiif/France/Angers/Bibliotheque_municipale/B490076101_MS0477/DEPOT/B490076101_MS0477_0053/5612,712,640,63/full/0/de
            <ref target="https://iiif.irht.cnrs.fr/iiif/France/Angers/Bibliotheque_municipale/B490076101_MS0477/DEPOT/B490076101_MS0477_0053/full/full/0/default.jp
            <lb/><w lemma="facio" lemmaRef="http://lila-erc.eu/data/id/lemma/102758" msd="3sg.pres.ind.pass." pos="VERB" xml:id="Ang.50a02c.0">fit</w> <w lemma="l
          </rdg>
          <note target="#Ang.50a02c" type="translation">light is caused in them at this time</note>
        </app>
      </gloss>
      <gloss facs="http://gams.uni-graz.at/iiif/o:glossvibe.bvi/IMAGE.1/162,1037,159,311/full/0/default.jpg" ana="#la" subtype="monolingual" target="#Jon_297_32a"
        <ref target="https://digital.onb.ac.at/RepViewer/image?doc=DTL_8650790&amp;img=00000008.jpg&amp;hash=5af078d09f16827f232e850ab1bec13c59557c6cc26f19236e380
        <lb facs="#facs_1_line_1626430534252_796"/><w lemma="uel" lemmaRef="http://lila-erc.eu/data/id/lemma/129695" pos="CCONJ" xml:id="BVi.01a19a.0"><choice><exp
        <lb facs="#facs_1_line_1626430538957_801"/><w lemma="sedes" lemmaRef="http://lila-erc.eu/data/id/lemma/124005" msd="nom.sg.fem." pos="NOUN" xml:id="BVi.01a
        <lb facs="#facs_1_line_1626430543741_806"/>copalis</w>
        <lb facs="#facs_1_line_1626430547701_811"/><w lemma="et" lemmaRef="http://lila-erc.eu/data/id/lemma/101542" pos="CCONJ" xml:id="BVi.01a19a.4"><choice><expa
        <lb facs="#facs_1_line_1626430553094_816"/><w lemma="graecus" lemmaRef="http://lila-erc.eu/data/id/lemma/55835" msd="nom.sg.masc." pos="NOUN" xml:id="BVi.
        <lb facs="#facs_1_line_1626430559094_821"/><choice><expan>ter</expan><abbr><am>t<g ref="#comb-tilde"/></am></abbr></choice><choice><expan>pretatur</expan><
        <lb facs="#facs_1_line_1626430561958_826"/>dida</w>
        <note target="#BVi.01a19a" type="translation">or the apse of the bishop's seat and ??? Greek and it is interpretated as bright</note>
        <note target="#BVi.01a19a" type="glossing">???</note>
      </gloss>
    </ab>
```

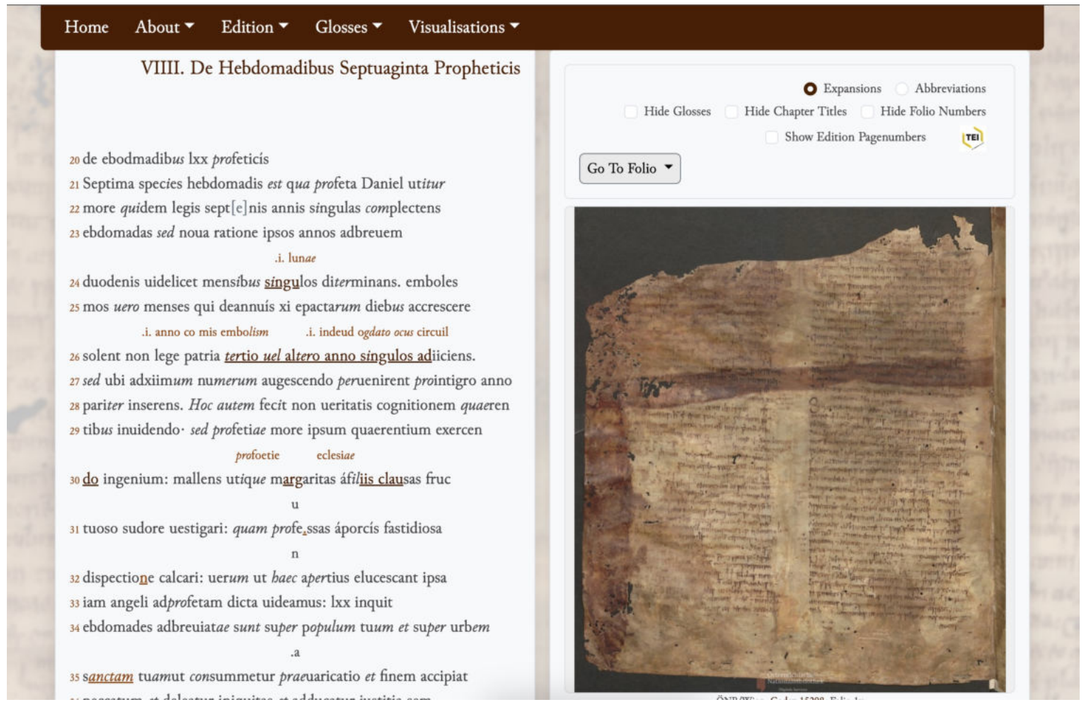
xml/TEI



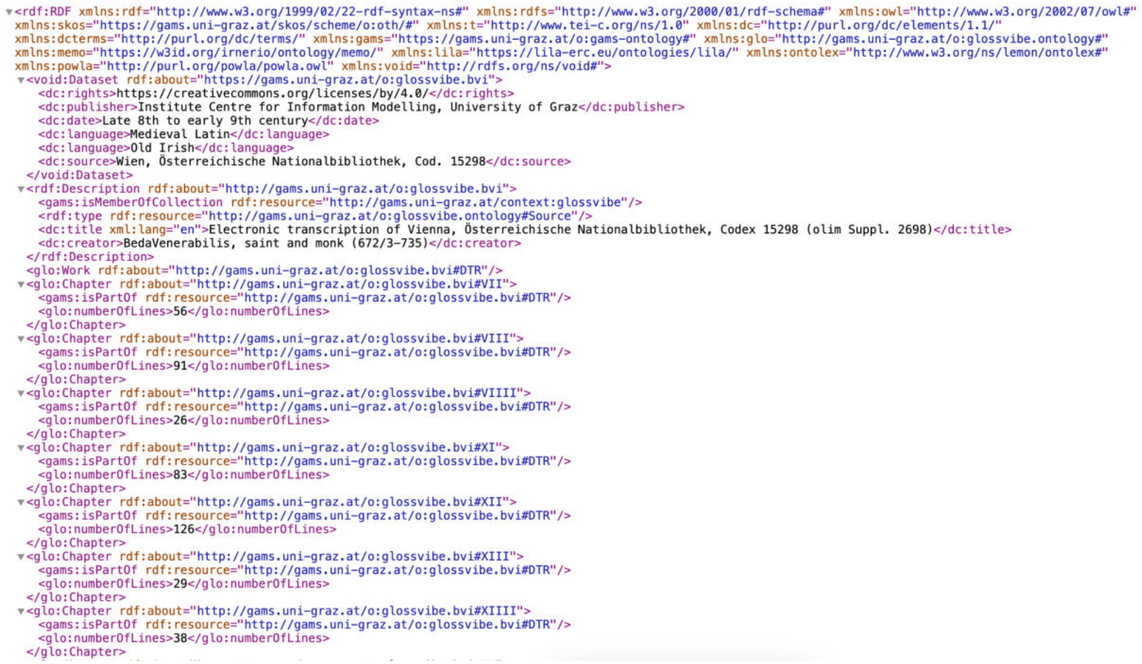
Gloss-ViBe: text & facsimile representation


```
<mets:mets xmlns:mets="http://www.loc.gov/METS/" xmlns:t="http://www.tei-c.org/ns/1.0" xmlns:xlink="http://www.w3.org/1999/xlink" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.loc.gov/METS/ http://www.loc.gov/mets/mets.xsd">
 <mets:dmdSec ID="DMD.1">
  <mets:mdWrap MDTYPE="MODS" MIMETYPE="text/xml">
   <mets:xmlData>
    <mods:mods xmlns:mods="http://www.loc.gov/mods/v3" version="3.5" xsi:schemaLocation="http://www.loc.gov/mods/v3 http://www.loc.gov/standards/mods/v3/mods.xsd">
     <mods:identifier type="urn">o:glossvibe.bvi</mods:identifier>
     <mods:titleInfo>
      <mods:title>Electronic transcription of Vienna, Österreichische Nationalbibliothek, Codex 15298 (olim Suppl. 2698)</mods:title>
     </mods:titleInfo>
     <mods:typeOfResource>text</mods:typeOfResource>
     <mods:genre authority="dct">text</mods:genre>
     <mods:accessCondition>Creative Commons BY-NC-SA 4.0</mods:accessCondition>
    </mods:mods>
   </mets:xmlData>
  </mets:mdWrap>
 </mets:dmdSec>
 <mets:amdSec ID="AMD.1">
  <mets:rightsMD ID="RMD.1">
   <mets:mdWrap MDTYPE="OTHER" MIMETYPE="text/xml" OTHERMDTYPE="DVRIGHTS">
    <mets:xmlData>
     <dv:rights xmlns:dv="http://dfg-viewer.de/">
      <dv:owner>Karl-Franzens-Universität Graz</dv:owner>
      <dv:license>Creative Commons BY-NC-SA 4.0</dv:license>
      <dv:ownerSiteURL>http://www.uni-graz.at</dv:ownerSiteURL>
     </dv:rights>
    </mets:xmlData>
   </mets:mdWrap>
  </mets:rightsMD>
  <mets:digiprovMD ID="PMD.1">
   <mets:mdWrap MDTYPE="OTHER" MIMETYPE="text/xml" OTHERMDTYPE="DVLINKS">
    <mets:xmlData>
     <dv:links xmlns:dv="http://dfg-viewer.de/">
      <dv:reference/>
      <dv:presentation/>
     </dv:links>
    </mets:xmlData>
   </mets:mdWrap>
  </mets:digiprovMD>
 </mets:amdSec>
 <mets:fileSec>
  <mets:fileGrp USE="DEFAULT">
   <mets:file ID="IMAGE.1" MIMETYPE="image/jpeg">
    <mets:FLocat LOCTYPE="URL" xlink:href="https://gams.uni-graz.at/o:glossvibe.bvi/IMAGE.1"/>
    <mets:FContent>
     <mets:xmlData>
```

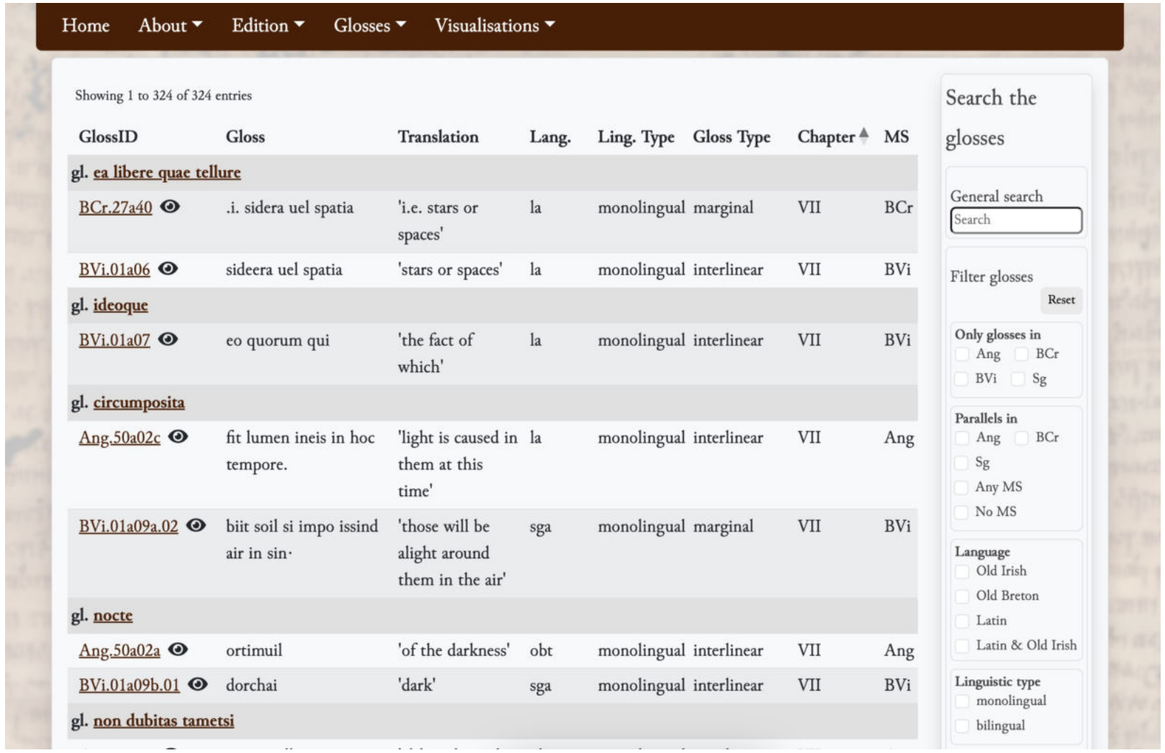

METS
Metadata Encoding & Transmission Standard



Gloss-ViBe: searchable list representation



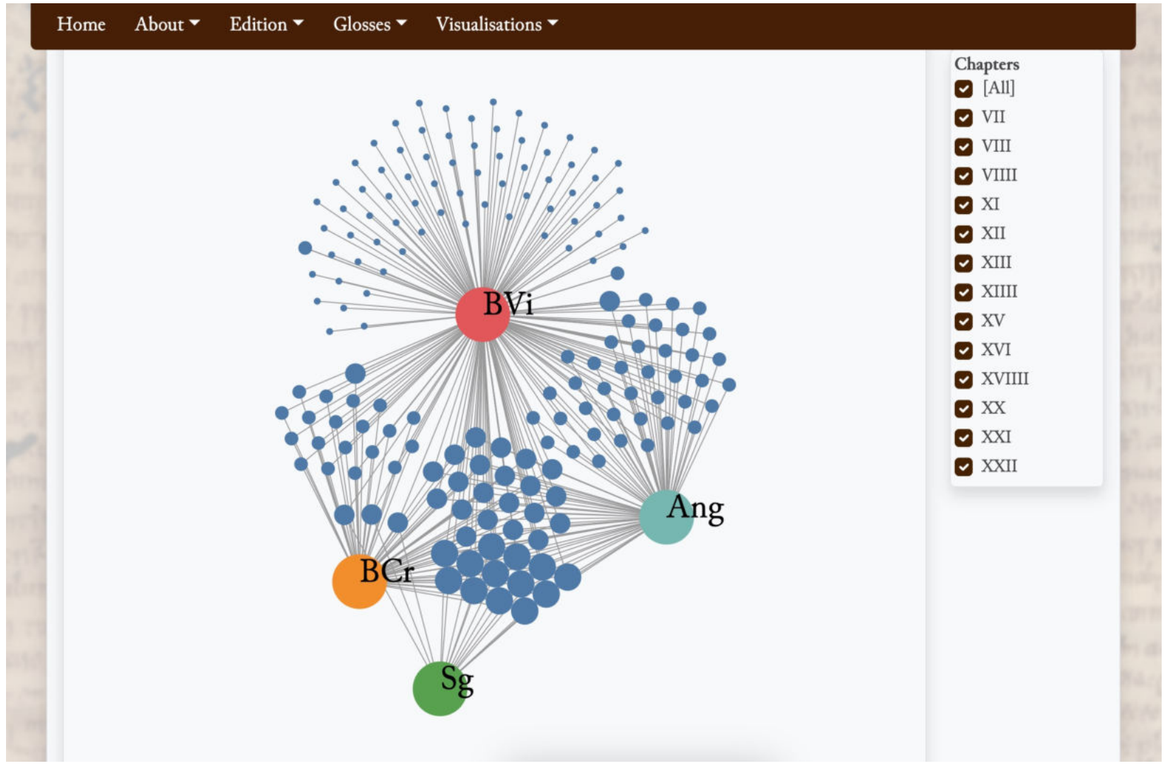
RDF
Resource Description Framework



Gloss-ViBe: visualisations

```
/*
 * author: Jakob Sonnberger & Bernhard Bauer
 * company: ZIM
 * purpose: JS for creating stats based on
 * - query:glossvibe.glosses4stats (language barchart)
 * - context:glossvibe/NETWORKJSON (network chart)
 * - query:glossvibe.parallelglosses4stats (parallel glosses barchart)
 * last update: 2023
*/

//run language barchart
function runLangChart(){
    fetch('/archive/objects/query:glossvibe.glosses4stats/methods/sdef:Query/getJSON')
        .then(result => result.json())
        .then(resultJSON => createLangChart(sortMe(resultJSON, 'book', 'language'), '#langChart'));
};

//run parallel glosses barchart
function  runParallelsChart(){
fetch('/archive/objects/query:glossvibe.parallelglosses4stats/methods/sdef:Query/getJSON')
    .then(result => result.json())
    .then(resultJSON=>createParallelsChart(resultJSON, '#parallelsChart'));
};

//run network chart
function runNetworkChart(){
    fetch('/context:glossvibe/NETWORKJSON')
        .then(result => { if (result.ok) return result.json() })
        .then(resultJSON => createNetChart(resultJSON, '#netChart'));
};

//sorter function for language barchart
function sortMe(obj, sortBy, countBy) {
    let x = obj.reduce(function (acc, item) {
        let key = item[sortBy];
        if (!acc[key]) acc[key] = {};
        let myAcc = acc[key];
        let myCount = item[countBy];
        myAcc[myCount] ? myAcc[myCount]++ : myAcc[myCount] = 1;
        return acc
    }, {})

    let map = [];
```

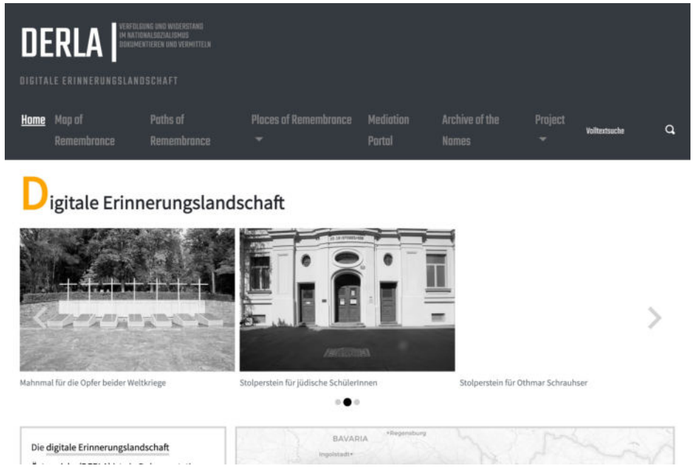
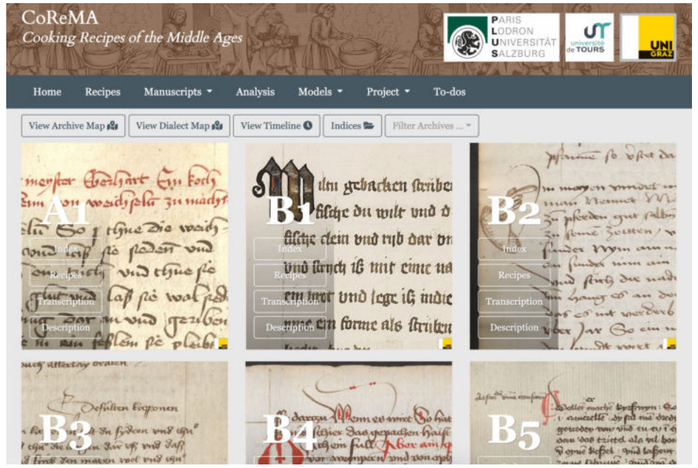
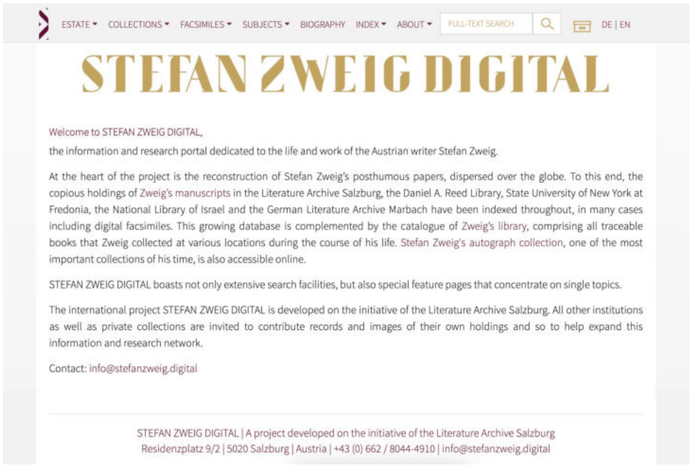
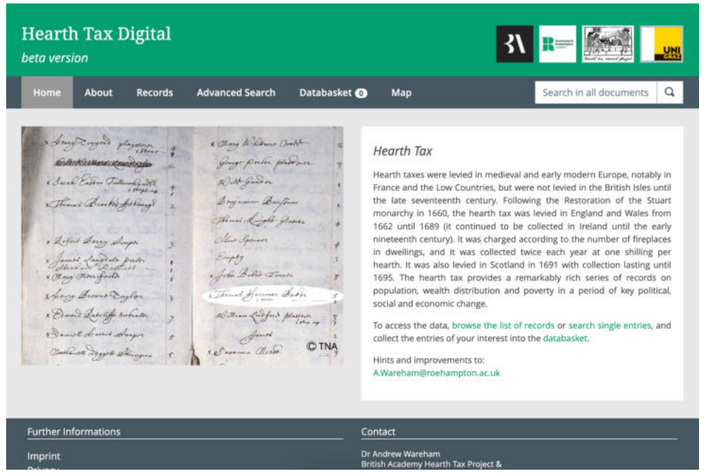
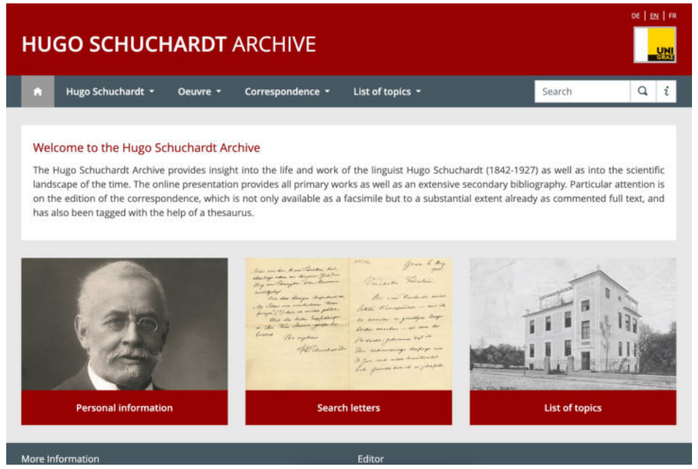
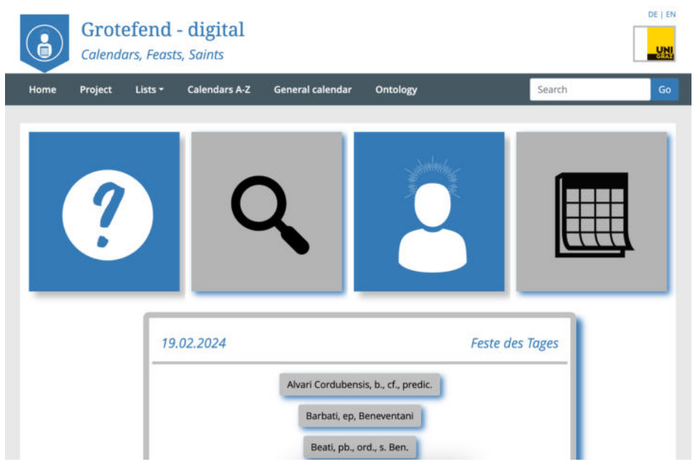
JS
Javascript



Gloss-ViBe: transformation files

(XSLT – Extensible Stylesheet Language Transformation)

```
<xsl:when test="$mode = 'barchart'">
    <section class="row gx-5 text-break">
        <article>
            <div
                class="card-body border shadow rounded bg-light rounded p-3">
                <div class="row">
                    <div class="col-md-10">
                        <h3>Languages per Chapter in BVi </h3>
                    </div>
                    <div class="col-md-2">
                        <a type="button"
                        href="/o:glossvibe.bvi/sdef:TEI/get?mode=about#bar"
                        class="btn btn-secondary btn-sm rounded border-0 text-right"
                        >More Information</a>
                    </div>
                </div>
                <div id="langChart" style="min-height: 500px"/>
            </div>
        </article>
        <script>
            $(document).ready(function(){runLangChart()})
        </script>
    </section>
</xsl:when>

<xsl:when test="$mode = 'parallelschart'">
    <section class="row gx-5 text-break">
        <article>
            <div
                class="card-body border shadow rounded bg-light rounded p-3">
                <div class="row">
                    <div class="col-md-10">
                        <h3>Parallel Glosses</h3>
                    </div>
                    <div class="col-md-2">
                        <!-- remove class disabled when fixed LINK ZU ABOUT-->
                        <a type="button"
                            href="/o:glossvibe.bvi/sdef:TEI/get?mode=about#par"
                            class="btn btn-secondary btn-sm rounded border-0 text-right"
                            >More Information</a>
                    </div>
                </div>
                <div id="parallelsChart" style="min-height: 500px"/>
            </div>
```

```
<?xml version="1.0" encoding="UTF-8"?>
<!--   TEI to RDF  -->
<xsl:stylesheet xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
    xmlns:xs="http://www.w3.org/2001/XMLSchema" xmlns:xsd="http://www.w3.org/2001/XMLSchema#"
    xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
    xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#" xmlns:owl="http://www.w3.org/2002/07/owl#"
    xmlns:skos="https://gams.uni-graz.at/skos/scheme/o:oth/#" xmlns:t="http://www.tei-c.org/ns/1.0"
    xmlns:dc="http://purl.org/dc/elements/1.1/" xmlns:dcterms="http://purl.org/dc/terms/"
    xmlns:gams="https://gams.uni-graz.at/o:gams-ontology#"
    xmlns:glo="http://gams.uni-graz.at/o:glossvibe.ontology#"
    xmlns:memo="https://w3id.org/irnerio/ontology/memo/"
    xmlns:lila="https://lila-erc.eu/ontologies/lila/"
    xmlns:ontolex="http://www.w3.org/ns/lemon/ontolex#"
    xmlns:powla="http://purl.org/powla/powla.owl"
    xmlns:void="http://rdfs.org/ns/void#"
    exclude-result-prefixes="xs xsd xsl" version="2.0">
    <xsl:strip-space elements="*"/>
    <xsl:preserve-space elements="t:ab"/>
    <xsl:preserve-space elements="t:gloss"/>
    <xsl:preserve-space elements="t:glossing"/>
    <xsl:preserve-space elements="t:lem"/>
    <xsl:preserve-space elements="t:rdg"/>
    <xsl:strip-space elements="t:w"/>
    <xsl:preserve-space elements="t:foreign"/>
    <xsl:preserve-space elements="t:note"/>

    <xsl:variable name="pid" select="//t:fileDesc/t:publicationStmt/t:idno[@type = 'PID']"/>
    <xsl:variable name="server">http://gams.uni-graz.at/</xsl:variable>

    <xsl:template match="/">
        <rdf:RDF>
            <void:Dataset rdf:about="https://gams.uni-graz.at/o:glossvibe.bvi">
                <dc:rights>https://creativecommons.org/licenses/by/4.0/</dc:rights>
                <dc:publisher>Institute Centre for Information Modelling, University of Graz</dc:publisher>
                <dc:date>Late 8th to early 9th century</dc:date>
                <dc:language>Medieval Latin</dc:language>
                <dc:language>Old Irish</dc:language>
                <dc:source>Wien, Österreichische Nationalbibliothek, Cod. 15298</dc:source>
            </void:Dataset>
            <rdf:Description rdf:about="{concat($server, $pid)}">
                <gams:isMemberOfCollection rdf:resource="http://gams.uni-graz.at/context:glossvibe"/>
                <rdf:type rdf:resource="http://gams.uni-graz.at/o:glossvibe.ontology#Source"/>
```

Have a look at more GAMS projects