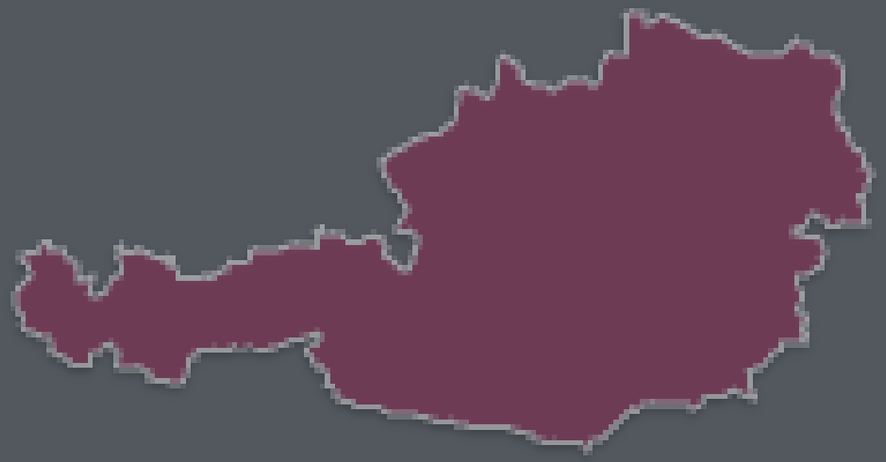

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# dboe@TEI
# Remodelling a Database of Dialects into a Rich LOD Resource

**Jack Bowers, Daniel Schopper, Eveline Wandl-Vogt**

Presented at TEI Members Meeting
October 2015
Lyon, France

# Database of Bavarian dialects of Austria (DBOE)

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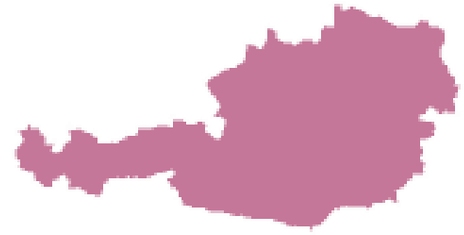
- Project collection of vocabulary from Bavarian dialects of what was then the Hapsburg monarchy/Austro-Hungarian Empire began in 1911…
- Estimated 4 million paper slips containing lexical, geographical and other information ….
- Collection of dialectal language data from locations around the former Austro-Hungarian Empire

**1911- Collection begins**



1963 - dictionary (**WBÖ**)

1998 database (**DBÖ)**

2010 dbo@ema online

2012 wboe[d] online

2013 wboe@SKOS (OpenUp! NHM)

**1998 Collection ends**

# Overview of Scenario:

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## Task:

- Convert our legacy dialectal, language data and metadata into formats that are:
    - compatible with one another (SQL and TUSTEP data);
        - ….
    - Make LOD compatible;
    - Bring formatting in line with standards for best practice

## Data:

- **TUSTEP Database**: 2 299 608 single data entry files; (728 drawers)
- MySQL (dbo@ema): +- 200,000 entries (4 drawers)

# Linguistic and Metadata

- Phonetic representation(s) of dialectal forms;
- Grammatical info:pos, number, case, etc.
- Details of word formation;
- Etymological information;
- Translation (&/or) definition of meaning;
- Related forms in other dialectal varieties;
- Location data for each record;
- Questionnaires used in elicitation of dialectal data;
- Bibliographic references;

# LOD Enhancement of DBOE

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**Motivations:**

- LOD offers means to base semantics for a given concept in predefined, inter/multi-lingual knowledge hubs;
- Desire to have access to dialectal data according to as many different lexical, semantic, geographic, temporal, features as possible;

**Sources & Services:**

- dbpedia; wikidata; geoNames;
- NHM (OpenUp!) Data (plantnames)
- BableNet/Babelfy;

**Applicable to:**

- Semantics/sense info for language/dialectal data;
- Geographical data;
- Grammatical, lexicographic data (ISOcat)
- Fragebogen; (questionnaires)

# Major Challenges in Converting DBOE to TEI

- **Heterogeneous formatting in TUSTEP records;**

*Dates can appear in a number of formats, with different levels of specificity:*

*e.g.* **(1936), c(1906), (1913-23)…**

*…many of which are incomplete:*

*e.g.* **(19xx), (19xx), c(1943-19xx)**

***Some entry records:***

*have empty fields;*

*have same category of data in different places*

```
**********
*A* HK 507, k5070426.foe, unkorr.
*HL* (r<ot)kopfecht:2
*NL* :
*VL* :
*QU* Tiersee Juffinger
*QN* {1C.3b03} nUInngeb.:nwNOTir.:öNTir.
*^@ FbB.JUFFINGER· (19xx)
[SFb./EFb./Mtlg.] *O* Thiers. NTir.
===
*NR* 53C5: rot in Komp. (rotfuchset,
Rotblättlein, feuerrot)
*LT1* rEotkopfat []
*BD/LT1* -- *ANMO* von gutaussehenden
Menschen
===
```

```
**********
*A* HK 191, t191^#249.52 =
t1910201.pla^#191.660
*HL* tschga:9
*QU* Schüttelkopf, Dt. TierN. in Kä., In:
Carinthia (1906) *S* II, 66 *N* 96
*QN* {wb} mkPubl./MdaWs.:TierN *^@
SCHÜTTELKOPF· (1906) S. [S-5637] *O*
===
*KT1* Tschgå, tschgå *KL* Fg:99 *O* Dtl.
*BD/KT1* Lockruf für Kälber
```

```
**********
*A* HK 204, d204^#1779.1 = tut1028.res^#1.398
*HL* Tschufit:1
*QU* STir. PflN und TierN (Sammelbel.)
^@^@^@
===
*LT1* Tschuffit *ANM* Duregger *O* Meran
*LT2* Tschufitt *O* Kardaun
*BD/LT1* Zwergohreule; Ephiattes scops Prag
```

# Major Challenges in Converting DBOE to TEI

- **Invalid (and invisible) non-unicode characters in text out put of both TUSTEP and SQL;**

Plâsepl:□me

F:□tterpl:□me

# Major Challenges in Converting DBOE to TEI

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- **Labeling @xml:lang for dialectal data;**

BCP 47 only specifies to the degree of country & administrative region;

***(language)-(country)-(region);***

***(ISO639)-(ISO3166)-(3166-2)***

*There is only perhaps one case when this is specific enough;*

***xml:lang="bav-AT-9"  Vienna  (ok)***

*However,*

***xml:lang="bav-AT-7"  Tyrol  (too vague)***

*Speech of places in the same region very often are very different, thus we need more specifics:*

***xml:lang="bav-AT-7-zillertal"  (not valid)***

*But… individual towns, place names, or any other geographical identifiers do not have official status in language identification systems*

***xml:lang="bav-AT-7-x-zillertal"  (private)***

# Major Challenges in Converting DBOE to TEI

- **Phonetic transcriptions not in reliably consistent notation:**
  - ***Individual data collectors may or may not have followed instructions to use common phonetic notation (Wienerisch Teuthonista)***
  - ***Different conventions were often used by data scientists entering the handwritten transcriptions into the DB;***
  - ***Representation of phonetic transcriptions in DB based on the notation of the handwritten transcription and not the phonetic forms themselves!***

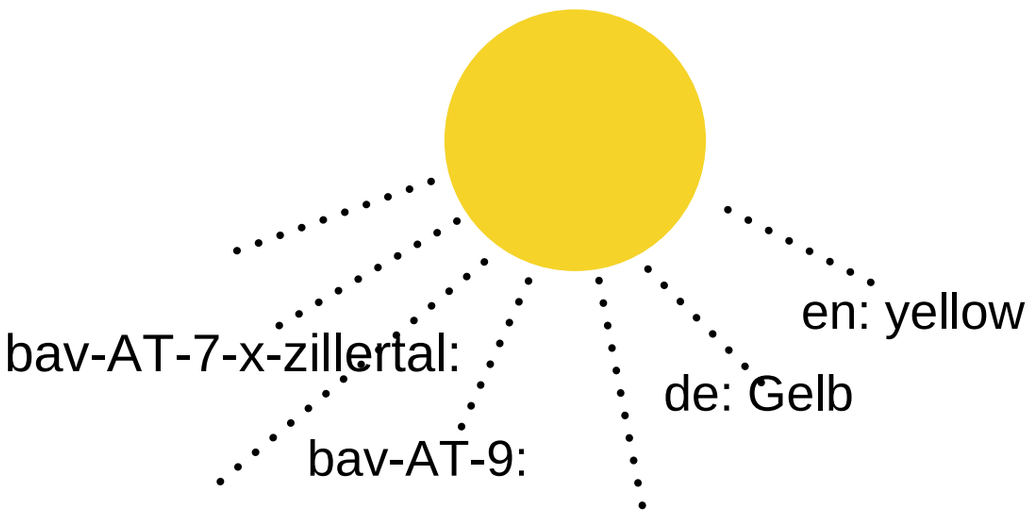
    *Thus, the accuracy of any attempt to convert data to IPA cannot be guaranteed!*

# Major Challenges in Converting DBOE to TEI

- **What is the best type of TEI output for data?**

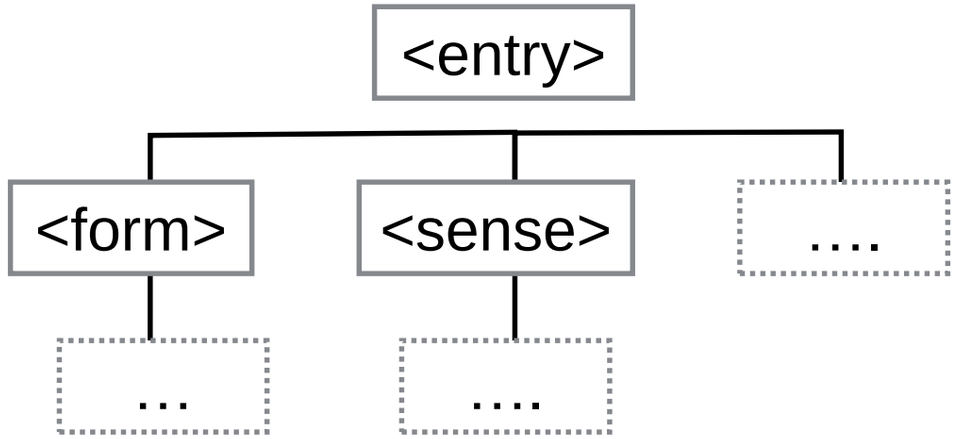
***Onomasiological or Semisiological***

Concept -> term




Form -> Sense

TEI Dictionary?




- **should we consider other formats?**
(TBX-TEI, hybrid?)

# Potential Output: TEI Dictionary with Etymology

*dialect-form:* ***dotE¡rgö¡lb***
*de:* ***dottergelb***
etymological-form :**(dotter)gëlb:2**
dialect-place :**Gm. Wien**

```
<entry xml:id="dottergelb-adj-wien-gersthof">
  <form type="lemma">
    <pron notation="tustep" xml:lang="ba-AT-9'>
      <seg xml:id="dtrGlbwnGer01">dotE¡r</seg>
      <seg xml:id="dtrGlbwnGer02">gö¡lb</seg>
    </pron>
    <gramGrp>
      <pos>adj</pos>
    </gramGrp>
  </form>
  <sense>
    <usg type="dom" corresp="http://dbpedia.org/resource/Color">Color</usg>
    <usg type="geo">
      <placeName type="district" ref="place:W">Wien-Gersthof</placeName>
    </usg>
    <cit type="translation">
      <oRef xml:lang="de">dottergelb</oRef>
    </cit>
    <etym type="compounding">
      <etym type="metonomy">
        <cit type="etymon" corresp="#dotter-Subs-wien">
          <pRef corresp="#dtrGlbwnGer01">dotE¡r</pRef>
        </cit>
      </etym>
      <cit type="etymon" corresp="#gelb-adj-wien">
        <pRef corresp="#dtrGlbwnGer02">gö¡lb</pRef>
      </cit>
    </etym>
  </sense>
</entry>
```

*Formatting in according to Bowers & Romary (Upcoming)*

# Workflow:
# TUSTEP > XML > TEI

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## TUSTEP entry

```
*A* HK 288, F288^#115.1 = F2880826.eck^#72.1
*HL* Fuchs:1
*QU* Schlagen b. Gmunden, Loitlesberger
*QN* {5.3a06} nöSkgt.:swTraunv.:OÖ *^@ Slg.LOITLESBERGER· (19xx) [Slg."PflN+TierN.Gmunden"+Erg.] *O* Schlagen in Gm. Gmunden OÖ
===
*NR* 53C6: rot versch. Abstufg. (purpurn, der Purpur)
*LT1* Fuks
*BD/LT1* rotes oder rötliches Pferd
```

## BASIC XML

```
<record n="21">
  <A>HK 288, F288^#115.1 = F2880826.eck^#72.1</A>
  <HL>Fuchs:1</HL>
  <QU>Schlagen b. Gmunden, Loitlesberger</QU>
  <QN>
    <bibl>{5.3a06} nöSkgt.:swTraunv.:OÖ *^@ Slg.LOITLESBERGER· (19xx) [Slg."PflN+TierN.Gmunden"+Erg.]</bibl>
    <O>Schlagen in Gm. Gmunden OÖ</O>
  </QN>
  <NR>53C6: rot versch. Abstufg. (purpurn, der Purpur)</NR>
  <LT1>Fuks</LT1>
  <BD_LT1>rotes oder rötliches Pferd</BD_LT1>
  <orig>….</orig>
</record>
```

TEI <fs> (grammatical features)

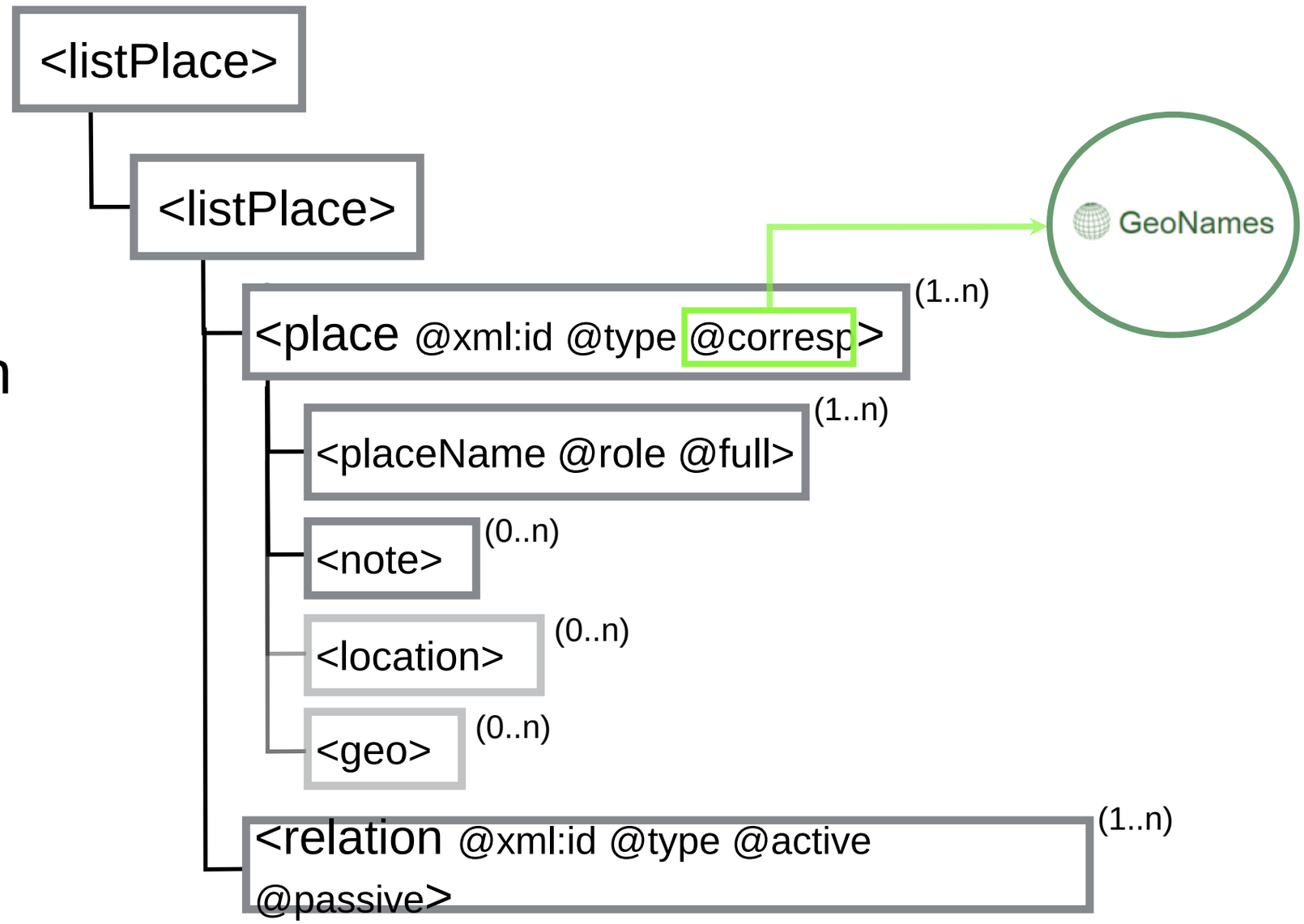
TEI (listPlace)

## TEI(list)

```
<item xml:id="d1e437" n="21">
  <ref type="archive">HK 288, F288^#115.1 = F2880826.eck^#72.1</ref>
  <cit type="etymon">
    <pRef>Fuchs</pRef>
    <gramGrp>
      <pos sameAs="lemma_wortat-tei-fs.xml#Sub">Sub</pos>
    </gramGrp>
  </cit>
  <ref type="source">Schlagen b. Gmunden, Loitlesberger</ref>
  <bibl>
    <ref>5.3a06</ref> nöSkgt.:swTraunv.:OÖ
     Slg.LOITLESBERGER· (<date>19xx</date>)
     [Slg."PflN+TierN.Gmunden"+Erg.]</bibl>
  <placeName>Schlagen in Gm. Gmunden OÖ</placeName>
  <ref type="questionnaire">53C6: rot versch. Abstufg. (purpurn, der Purpur)</ref>
  <cit type="lautung" xml:id="d1e451" n="1">
    <pRef>Fuks</pRef>
  </cit>
  <cit type="translation" corresp="#d1e451">
    <oRef xml:lang="de">rotes oder rötliches Pferd</oRef>
  </cit>
</item>
```

# Key TEI Documents: listPlace

- Inventory of all known places from which we have language data;
- Establishing inventory of such references enables the option of tagging with attribute or element values in using data;
- Reusable and extensible w/in our project and institution;
- Enhance original information from LOD sources like GeoNames..



# Defining Location: Relational Hierarchies

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```
…
  <place xml:id="Öst" type="region" subtype="administrative"
       corresp="http://sws.geonames.org/2782113/about.rdf">
    <placeName role="main">
      <placeName full="abb" xml:lang="de">Öst.</placeName>
      <placeName full="yes" xml:lang="de">Österreich</placeName>
    </placeName>
    <location>
      <geo corresp="#gis_region_id-862"/>
    </location>
  </place>
```

**Österreich**
Tirol
Nord Tirol
Mittel Nord Tirol
**Zillertal**

```
…
<relation name="parentRegion" active="#Öst" passive="#Bgl #Kä #NÖ #OÖ #Sa #St #Tir #W #OÖst #SÖst #NÖSt #WÖSt"/>  *

<relation name="parentRegion" active="#Tir" passive="#NTir #OTir #TirHocht #sbairTir #TirÜGeb"/>

<relation name="parentRegion" active="#NTir" passive="#wNTir #öNTir #mNTir #Innt"/>

** <relation name="parentRegion" active="#mNTir" passive="#Stub #Zillert #Sillgeb #mInntInnsbr"/>

*** <place xml:id="Zillert" type="region" corresp="http://sws.geonames.org/2760567">
      <placeName role="main">
        <placeName full="abb" xml:lang="de">Zillert.</placeName>
        <placeName full="yes" xml:lang="de">Zillertal</placeName>
      </placeName>
      <location>                                    (i..n)
        <geo corresp="#gis_region_id-771"/>
      </location>
      <note>häufige Abk. "Zill.": Tal der Ziller samt einmündender Alpentäler im SO vom —: #mNTir.# ---
- vom Sammler Michael Juffinger mit der Ziffer IV bezeichnet ---</note>
    </place>
```

# Defining Location: LOD Aspect

de: **Zillertal**

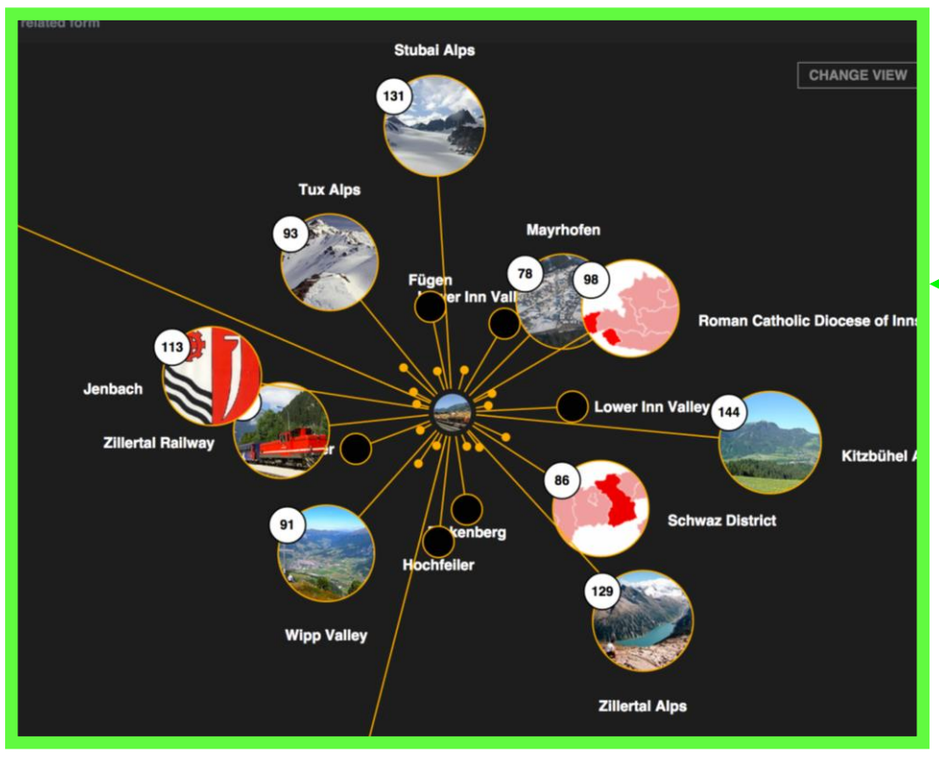
TEI <place>

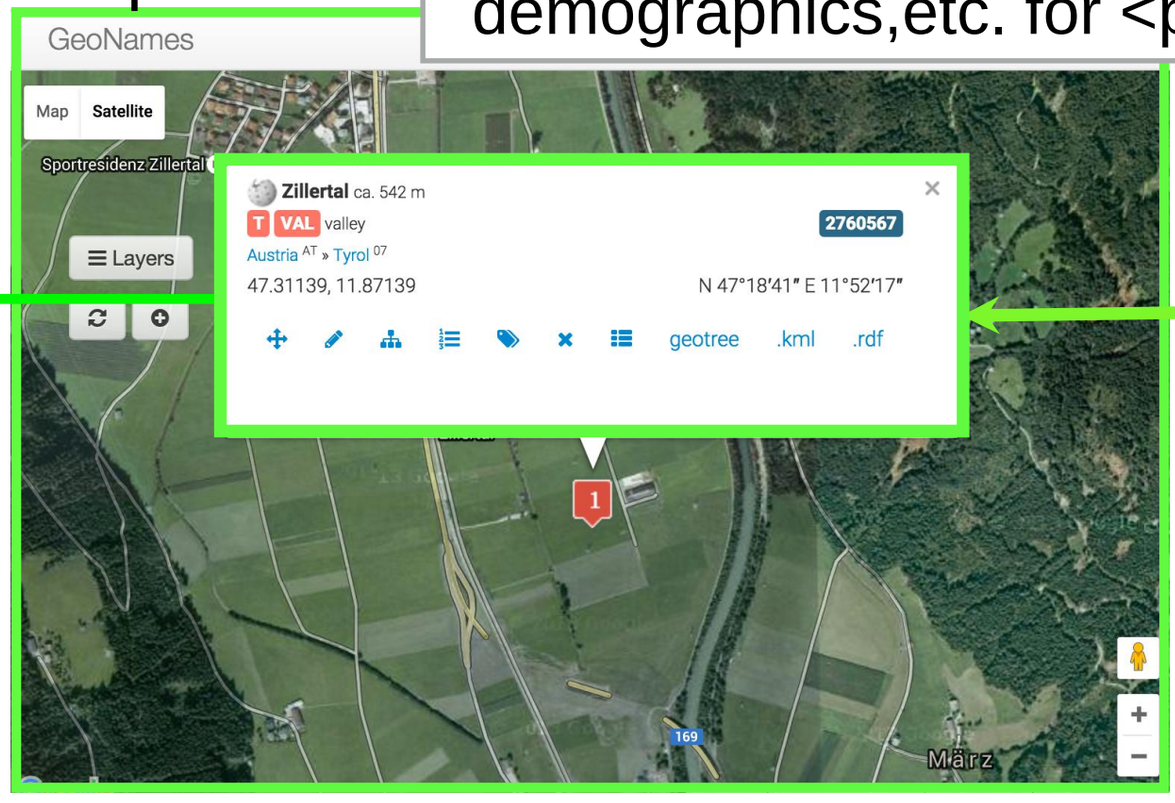
geoNames uri

```
<place xml:id="Zillert" type="city" corresp="http://sws.geonames.org/2760567">
  <placeName role="main">
    <placeName full="abb" xml:lang="de">Zillert.</placeName>
    <placeName full="yes" xml:lang="de">Zillertal</placeName>
  </placeName>
  <location>
    <geo corresp="#gis_region_id-771"/>
  </location>
  <note>häufige Abk. "Zill.": Tal der Ziller samt einmündender Alpentäler im SO vom —: #mNTir.#
--- vom Sammler Michael Juffinger mit der Ziffer IV bezeichnet ---</note>
</place>
```

geoNames: geo co-ordinates, demographics,etc. for <place>

geoNames: linked data, related concepts



# Defining Location: LOD Aspect

Place:

en: **Tyrol**

de: **Tirol**

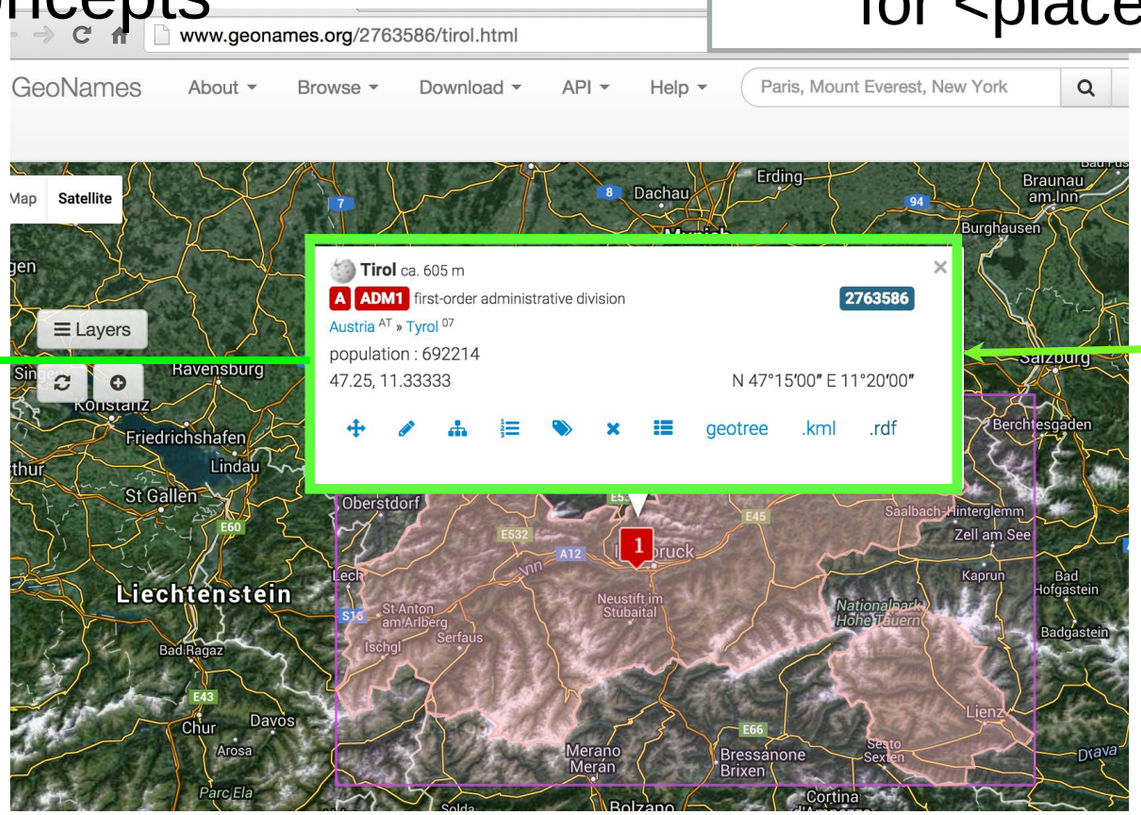
TEI <place>

```
…
<place xml:id="Tir" type="region" subtype="administrative" corresp="http://sws.geonames.org/2764958">
  <placeName role="main">
    <placeName full="abb" xml:lang="de">Tir.</placeName>
    <placeName full="yes" xml:lang="de">Tirol</placeName>
  </placeName>
  <location>
    <geo corresp="#gis_region_id-762"/>
  </location>
  <note>nicht eindeutige und daher eher zu vermeidende Bez.: "Alttirol" für --:
    #OTir.#, #NTir.#, #STir.# und Bld. Tirol mit --: #OTir.#, #NTir.# (EKü.)</note>
</place>
…
```

geoNames uri

geoNames: geo co-ordinates, demographics,etc. for <place>

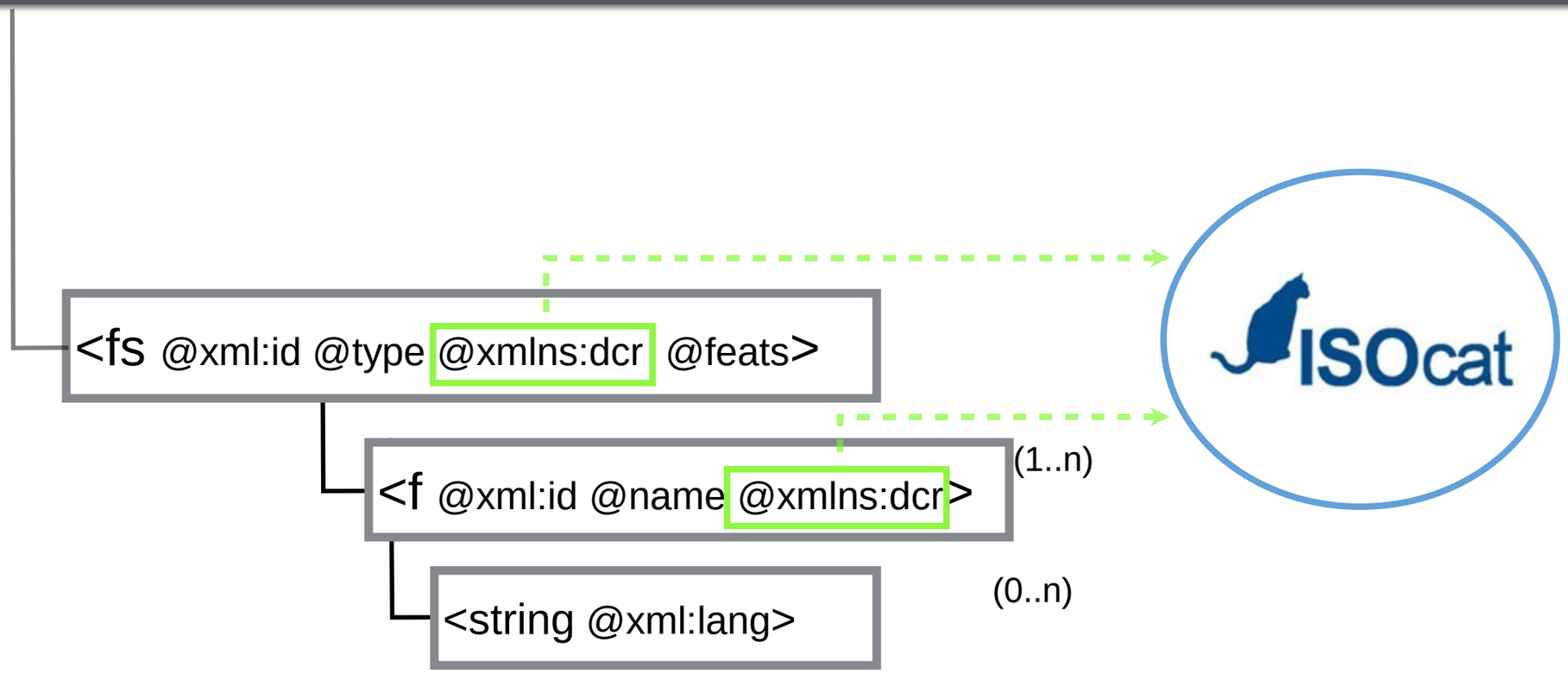
geoNames: linked data, related concepts

# Key TEI Documents: Feature Structures for Lexical, Grammatical Categories

- Original (TUSTEP) entries has extensive inventory of grammatical and lexical features;
- TEI feature structures compiled manually according to documentation of guidelines;
- Basic part of speech tag (subs, verb, adj, adv, interj, conj,…etc) inherited from etymological descendant form (Hauptlemma);
- Further detail as to subcategorization, context, inflection form(s), and collocation specified for each dialectal form (Lautung);

# Key TEI Documents:
# Feature Structures for Lexical, Grammatical Categories




<fs> used for categorical features, and for complex categories (needing to reference combine multiple features);

<f> used for most basic categories and for features for which we want to specify value in one or more strings;

# Grammatical information in dialectal data

e.g.

***HL*  :1 = Substative**

*A* HK 165, d165^#1993.1 = T1650708.sch^#18
***HL* T<ötling:1**
*QU* Schüttelkopf Dt. Tiern in Kä. - In: Carinthia II,96 (1906) *S* 66
*QN* {wb} mkPubl./MdaWs.:TierN *^@ SCHÜTTELKOPF· (1906) S. [S-5637]  *O* ob. Mllt.
===
***LT1* Tötling [m]**
*BD/LT1* abgespäntes Kalb

```
<f name="Substantiv" n="1" xml:id="Sub"
xmlns:dcr="http://www.isocat.org/ns/dcr"
dcr:datcat="http://www.isocat.org/datcat/DC-3347">
....
</f>
...
<fs type="Gender" xmlns:dcr="http://www.isocat.org/ns/dcr"
   dcr:datcat=" http://www.isocat.org/datcat/DC-3217">

   <f name="MasculineGender" xml:id="Masc"
xmlns:dcr="http://www.isocat.org/ns/dcr"
dcr:datcat="http://www.isocat.org/datcat/DC-3312">
      <string>m</string>
   </f>
   ......
</fs>
```

***LT1*  [m] = Masculine**

# Grammatical information in dialectal data

e.g.

***HL*  :1 = Substative**

```
<f name="Substantiv" n="1" xml:id="Sub" xmlns:dcr="http://www.isocat.org/ns/dcr"
dcr:datcat="http://www.isocat.org/datcat/DC-3347">
....
  <fs type="diminutive" xml:id="SubD" dcr:datcat="http://www.isocat.org/datcat/DC-4922">
        <!-- D = Deminutiv/Diminutive = Verkleinerungsform/Koseform (ohne näh.
Unterscheidung);-->

     <f name="diminutive-lein" xml:id="SubD1"/>
       <!-- D1 = 1. Deminutiv: Häusl, Dearfö (Dörflein), Stüble (lemmatisiert -lein)-->

     <f name="diminutive-ellein" xml:id="SubD2"/>
       <!-- D2 = 2. Deminutiv: Häuserl, Hansei, Hantale, Fußile (lemmatisiert -ellein) -->

     <f name="diminutive-i" xml:id="SubD3"/>
       <!-- D3 = Koseform auf -i: Greti, Pferti, Katzi -->
  </fs>
....
```

```
*A* HK 295, f295^#2793.1 = f2951202.pir^#108.1
*HL* Procken:1
*QU* Tullnitz Mühlhauser
*QN* {8.3c04} Jaispitzt.:nöSMä. *^@ FbB.MÜHLHAUSER· (1922-35)
[SFb.1-6,12-108/EFb.4-9/WrFb.1/Mtlg.] *O* Tullnitz SMä.
===
*NR* 30C23 (F): gr./kl. Brotstück (Reankn, Bröckel,*); Ra.; Komp.
*LT1* Brèkl [D1]
*LT2* Brèka¡rl [D2]
*BD/LT1* kleines und kleinstes Stückchen Brot
```

***LT1*  [D1] = Diminutive (dialectal cognate to High German ‘-lein’)**
***LT2*  [D2] = Diminutive (dialectal cognate to High German ‘-ellein’)**

# Grammatical information in dialectal data

e.g.

***HL*  :1 = Substative**

```
<f name="Substantiv" n="1" xml:id="Sub" xmlns:dcr="http://www.isocat.org/ns/dcr"
dcr:datcat="http://www.isocat.org/datcat/DC-3347">
....
</f>
<fs type="Gender" xmlns:dcr="http://www.isocat.org/ns/dcr"
  dcr:datcat=" http://www.isocat.org/datcat/DC-3217”>

  <f name="MasculineGender" xml:id="Masc" xmlns:dcr="http://www.isocat.org/ns/dcr"
dcr:datcat="http://www.isocat.org/datcat/DC-3312">
    <string>m</string>
  </f>
 </fs>
<fs type="Article" xml:id="Article" xmlns:dcr="http://www.isocat.org/ns/dcr"
dcr:datcat="http://www.isocat.org/datcat/DC-1892">

  <f name="definiteArticle" xml:id="A-def" xmlns:dcr="http://www.isocat.org/ns/dcr"
dcr:datcat="http://www.isocat.org/datcat/DC-1430">
    <string>A</string>
  </f>
</fs>
```

*A* HK 230, f230^#1382.1 = falh0922_pir^#9.1
*HL* **Falb:1**
*QU* Linz Wagner
*QN* {5.2a41} Linz:nHausrv.:OÖ *^@ FbB.WAGNER· (19xx) [SFb./EFb.] *O* Linz OÖ
===
*NR* 53E8: der Falb(e)/Falch(e) als TierN etc.
*LT1* **da fåib [m+A]**
*LT2* **d' fåim [pl+A]**
*BD/LT1* der Falb (gelblichgraue Pferde)

***LT1*  [m+A] = Masculine + Definite Article**

***LT2* [pl+A] = Plural + Definite Article**

*(Note: gender specified in first *LT* applies to all *LT* for given entry)*

# Key TEI Documents: Feature Structures for Concepts

- Can contain all and any uri for a given concept in separate <f>'s under the same <fs>;
- Reusable and extensible w/in our project and institution;
- Usable for both the dialectal data and for certain parts of the original data such as the field questionnaires that were used to elicit lexical data from speakers;
- (where possible) concepts will correspond to the sense of a given lexical item;
- LOD/RDF compatible;

# Key TEI Documents:
# Feature Structures for Concepts

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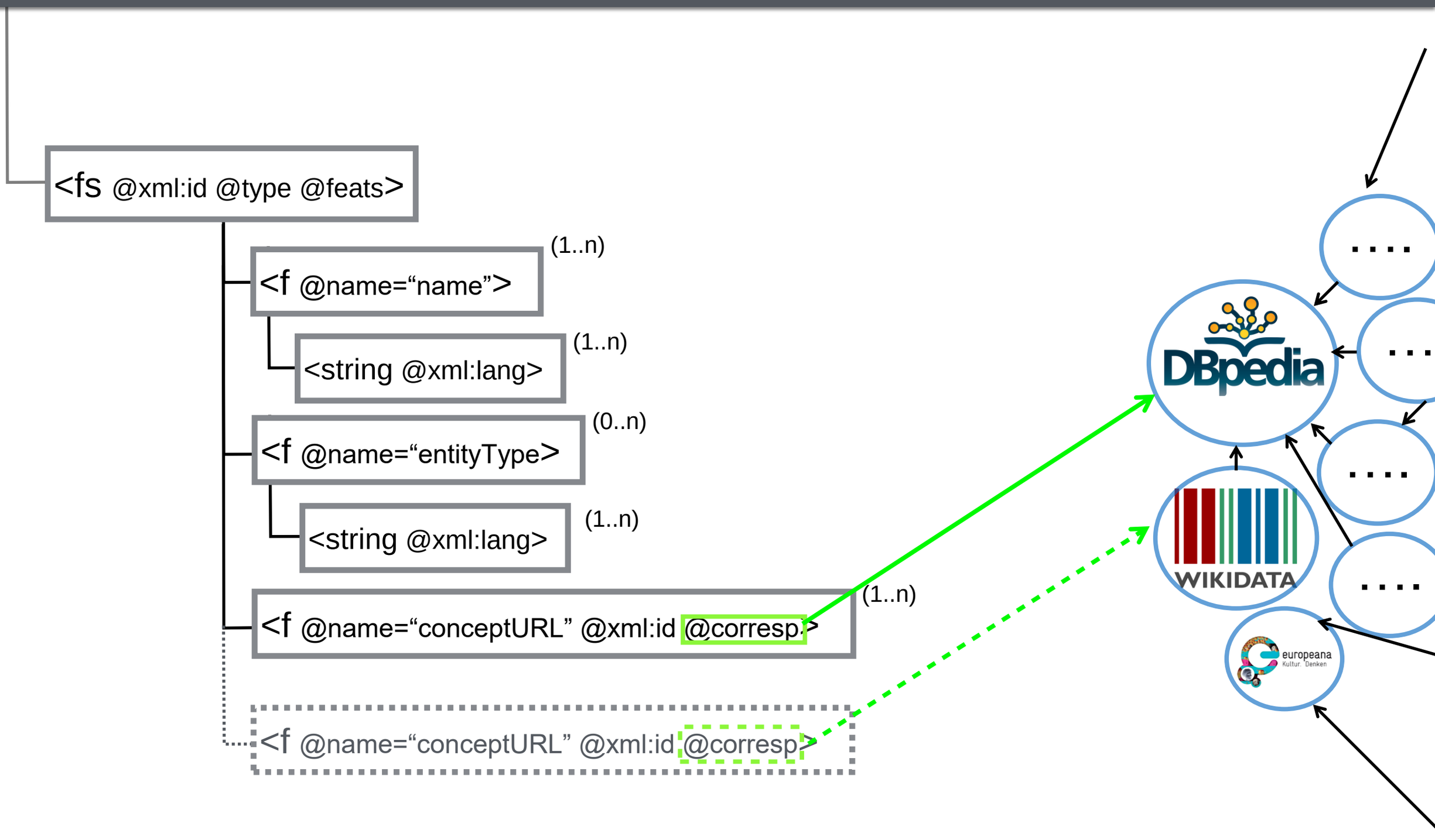


# Output with Links: Plantnames

Sample TEI record (from SQL data):

*Taraxacum officinale Weber*

```
<list type="wordforms" corresp="concept:d1e31">
...
  <item>
    <cit type="example" xml:id="o151503">
      <quote>Hasenohrwaschel</quote>
      <usg type="geo">
        <placeName type="region" ref="place:Zillert">Zillert.</placeName>
      </usg>
    </cit>
  </item>
...
```

...

Conceptual Reference <fs>

```
<fs type="concept" xml:id="d1e31">
  <f name="name">
    <string xml:lang="la">Taraxacum officinale Weber</string>
  </f>
  <f name="name">
    <string xml:lang="de">Wiesen-Löwenzahn</string>
  </f>
  <f name="entityType">
    <string xml:lang="en">plant</string>
  </f>
  <f name="conceptURL"
    xml:id="d1e31_cURL1"
    corresp="http://dbpedia.org/resource/Taraxacum_officinale"/>
  <f name="conceptURL"
    xml:id="d1e31_cURL2"
    corresp="http://openup.nhm-wien.ac.at/commonNames/references/
scientificName/3926"/>
</fs>
```

.....

Place Reference <listPlace>

```
<place xml:id="Zillert" type="region" corresp="http://sws.geonames.org/2760567">
  <placeName role="main">
    <placeName full="abb" xml:lang="de">Zillert.</placeName>
    <placeName full="yes" xml:lang="de">Zillertal</placeName>
  </placeName>
  <location>
    <geo corresp="#gis_region_id-771"/>
  </location>
  <note>häufige Abk. "Zill.": Tal der Ziller samt einmündender Alpentäler im SO vom —:
#mNTir.# --- vom Sammler Michael Juffinger mit der Ziffer IV bezeichnet ---</note>
</place>
```

# Linking of dialectal data with conceptual infrastructures

austrian centre for digital humanities

ÖAW ÖSTERREICHISCHE AKADEMIE DER WISSENSCHAFTEN

## Dialectal entries: *(from TUSTEP)*

dialect-form: **gäb**
de: **gelb**
etymological-form: **gëlb**
dialect-place: **Kufstn. NTir.**

dialect-form: **göl¡bw**
de: **gelb**
etymological-form: **gëlb**
dialect-place: **Kl.Feistritz**

Concept:
de: **gelb**
*(en: yellow)*

## Feature structure

```
<fs type="concept" xml:id="c1e3186">
  <f name="name">
    <string xml:lang="de">Gelb</string>
  </f>
  <f name="entityType">
    <string>color</string>
  </f>
  <f name="conceptURL" xml:id="c1e3186_cURL1"
     corresp="http://dbpedia.org/resource/yellow"/>
</fs>
```

## BabelNet entry

bn:00081866n • NOUN • Concept • Categories: Farbreproduktion, Farbname

**Gelb** · **Bronzegelb** · **Eurogelb** · **Goldgelb (Farbe)** · **Hellgelb**

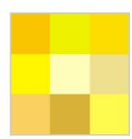
Gelb ist die Farbe, die wahrgenommen wird, wenn Licht mit einer spektralen Verteilung ins Auge fällt, bei der Wellenlängen zwischen 565 und 575 nm dominieren.

More definitions

| | |
|---|---|
| IS A | Spektralfarbe • Grundfarbe • Farbe |
| COLOR SPACE | CMYK-Farbmodell |
| SOURCE | Webfarben |

EXPLORE NETWORK




*related concept*

# Next Steps:

- Continue refining conversion process
- Integrate concepts <fs> with more output (NLP, manual)
- Begin converting groups of vocabulary
- Develop phonetic <fs> inventory for all transcription systems used in DBOE
- TEI Dictionary *(???)*
  - Enhanced markup for
  - Etymology; LOD semantics, inflection,…
- Conversion to RDF*(?)*
- Analyses of linguistic content
- Visualize data from DBOE (TUSTEP) and (DBO@ema) by geographic, temporal and lexical features

# Danke!

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## Contact

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