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digital library

Complexity and simplicity in eInfrastructures - some issues

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DINI meeting, Oldenburg, 8 Okt. 2007

What I will not speak about

- Long term archiving
- Publications and publication repositories
- Open access
- Grid computing
- eSciDoc… or you will not notice it

Background

- Many initiatives to provide research infrastructures at national and EU level
- What do they or will they offer?
- Do we match the scientists' expectations?
- Access, standards and community building.

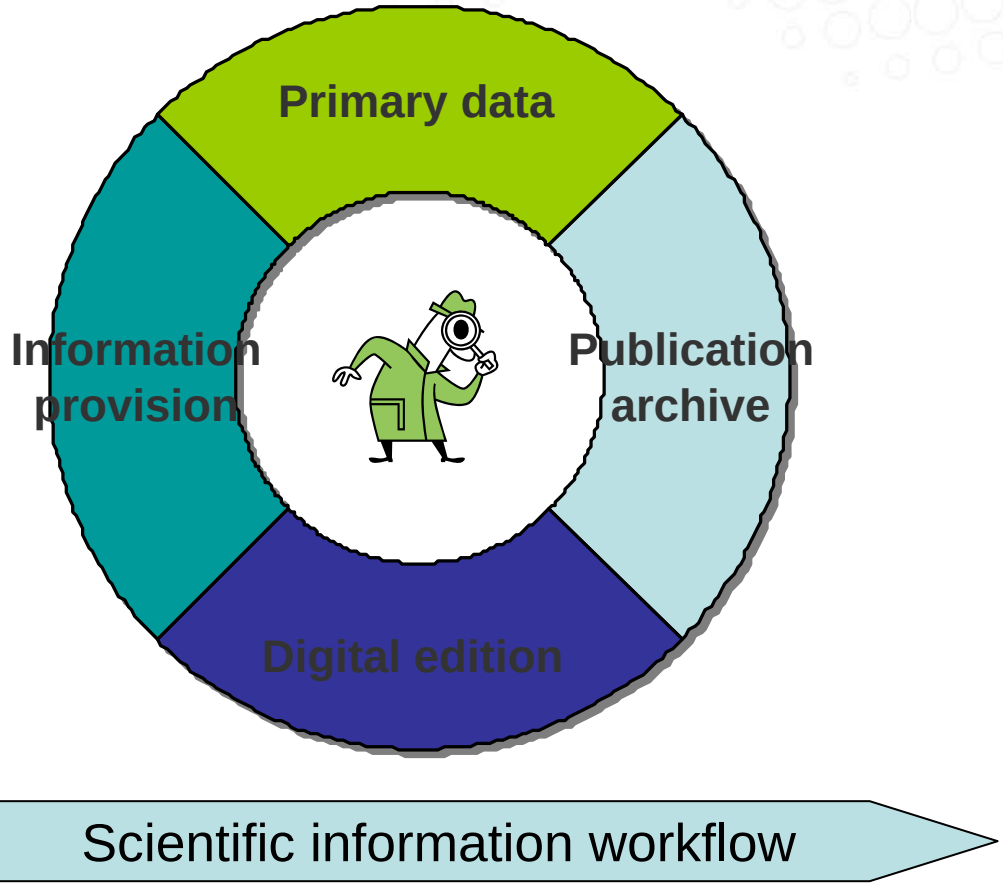
…with a view on the humanities

Why do we need eInfrastructures?

- The scientist's ecology

- Central role of research data and primary sources

The Scientist's (digital) ecology



Working with research data

- Wide variety and complexity
  - High Energy Physics
    - Particle accelerators / colliders
  - Meteorology
    - Computer simulations
  - Astrophysics
    - Observations, stellar object descriptions
  - Biology
    - Spectrographic representations
  - Linguistics
    - Corpora, grammars, lexical databases

Research Infrastructures

- RIs in general: permanent and physical
- RIs for the natural sciences
  - ice breakers for polar research, satellites, telescopes, particle accelerators, laboratories
- RIs for the humanities?
  - Cultural heritage in all forms is the main source of humanities research
  - Libraries and archives are the traditional “laboratories” for the humanities
- In the digital age, essential for innovative humanities research is:
  - Access to digitised heritage data (data bases, text corpora, speech, image collections, etc.)
  - Tools to process this information

Working with primary (digital) sources in the humanities

Metadata

Annotation

Transcription

Metadata

Translation

Metadata

Annotation

Core activities

- Digitise – Curate – Preserve
  - Standards development and promotion
  - Curation, preservation and digitisation services
  - Technology platforms
  - Legal services and advice
- Discover – Access – Deliver
  - Authentication and authorisation,
  - Harvesting, aggregating, hosting
  - User-friendly discovery, delivery and use
- Connect – Collaborate – Use
  - Supporting communities of practice
  - Facilitating new research practice
  - Tools and registries

Some guidelines

- Mastering the technology
  - Not all scientist are technological geeks
    - Transparency
- Answering priority needs
  - Strong request to provide infrastructures for simple types of data
    - Pragmaticism
- Preserving scientific patrimony
  - High amounts of research data is continuously lost
    - Identification, preservation

Dealing with the complexity

- A selection of core issues
  - Standardisation
  - Tools
  - Documentation
  - Curation
- A specific application
  - Lexical data description

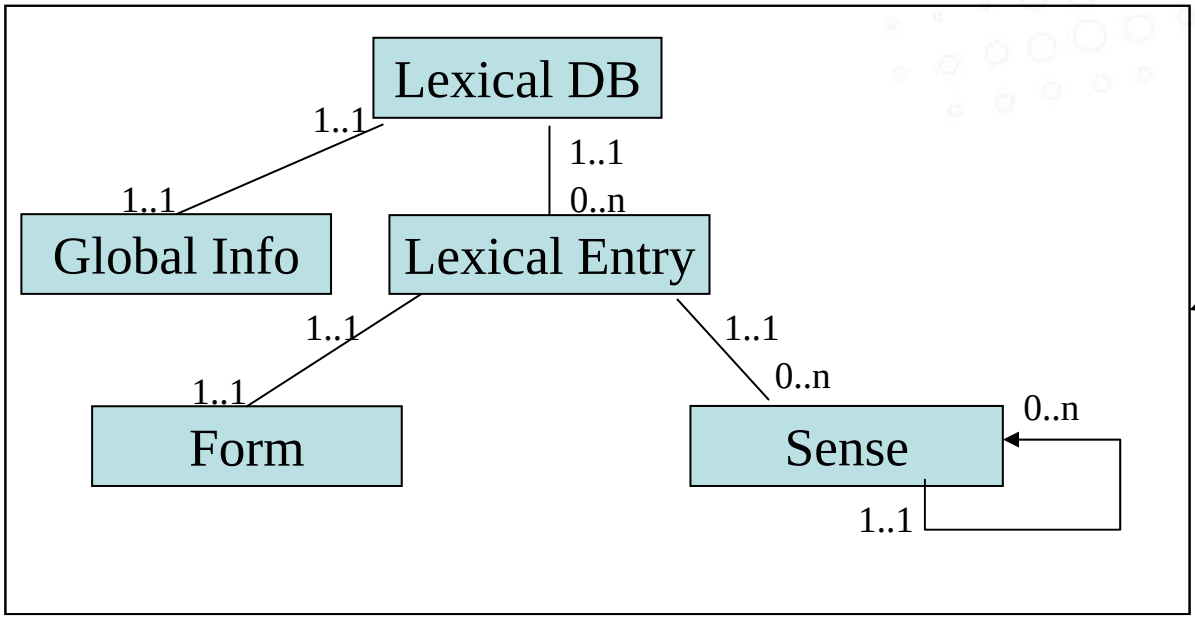
Background: Representing lexical data

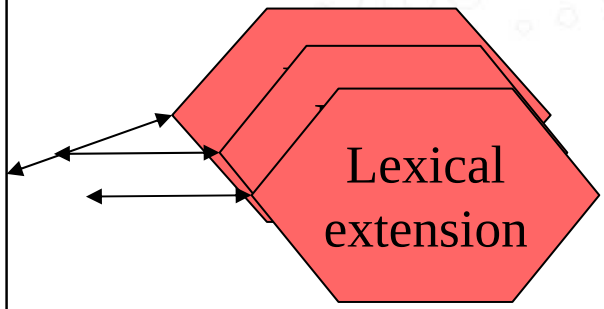
- First level of abstraction in linguistic analysis
  - Psycholinguistic, field linguistics, computational linguistics
- A huge amount of legacy information
  - Proprietary formats
  - Proprietary tools
    - E.g. Shoebox
- Variety of needs
  - Language description, dictionary making, automatic processing

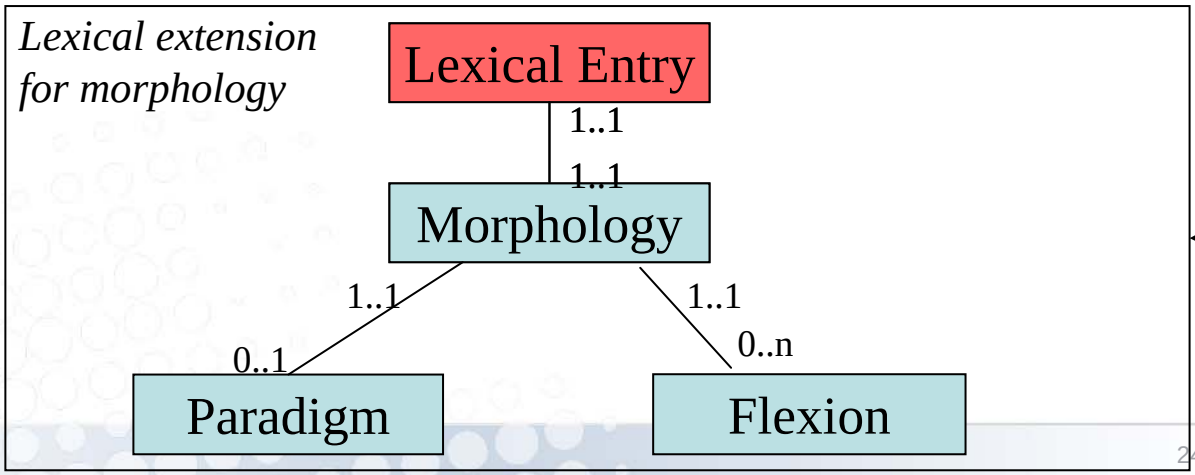
Issue 1: Can scientists bear standards?

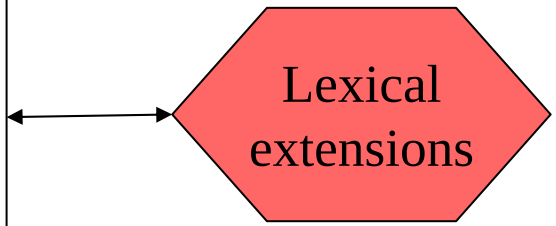
- Standards are essentially bad for scientists
  - Freezing knowledge
  - Making one lose time that could be dedicated to research
  - Forcing diverging views to agree
- A positive view on standards
  - Documenting data
  - Giving semantics to data
  - Pooling data from various origins
  - Allowing interoperability of tools
- A possible answer
  - Standards as specification platforms
    - Example:
      - ISO committee TC 37/SC 4 (Language resource management)
        - LMF - Lexical Markup Framework

ISO 24613 LMF: Lexical Markup Framework

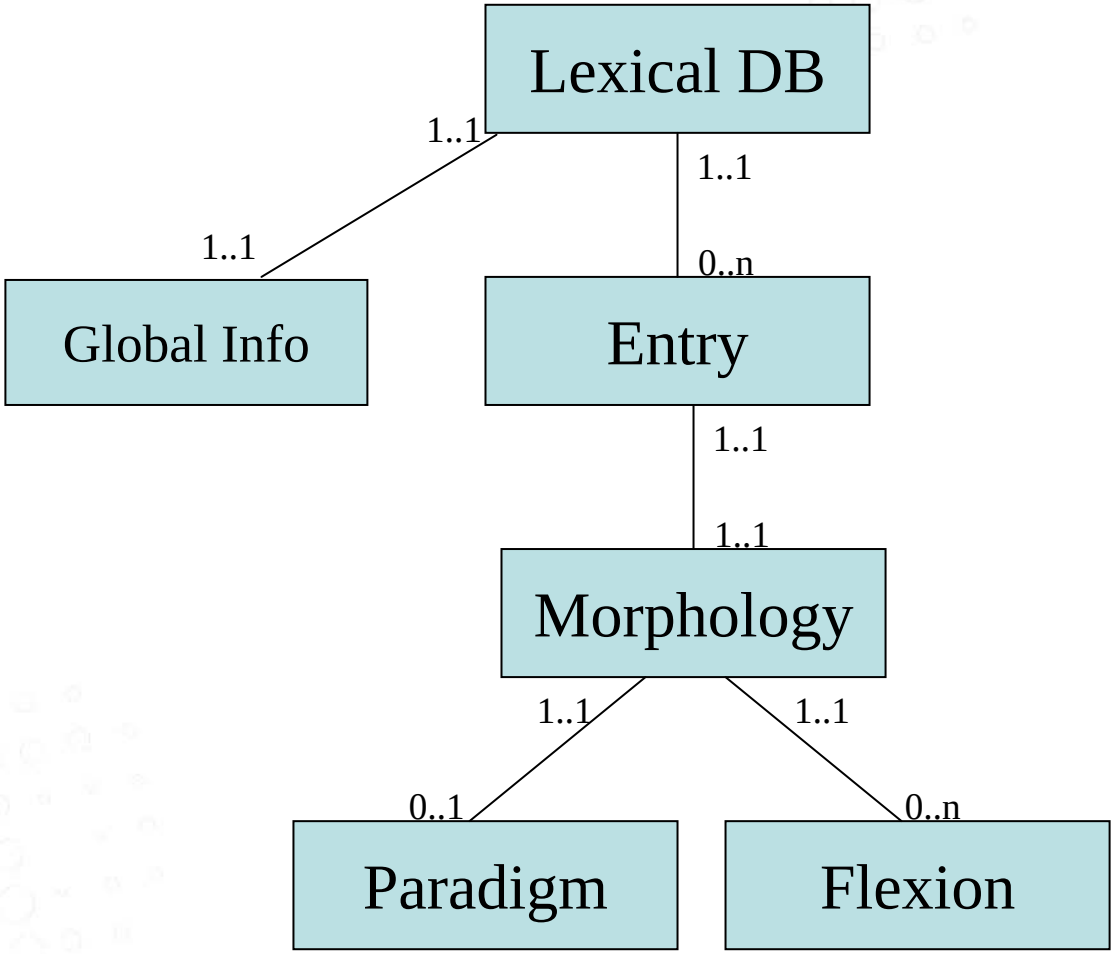




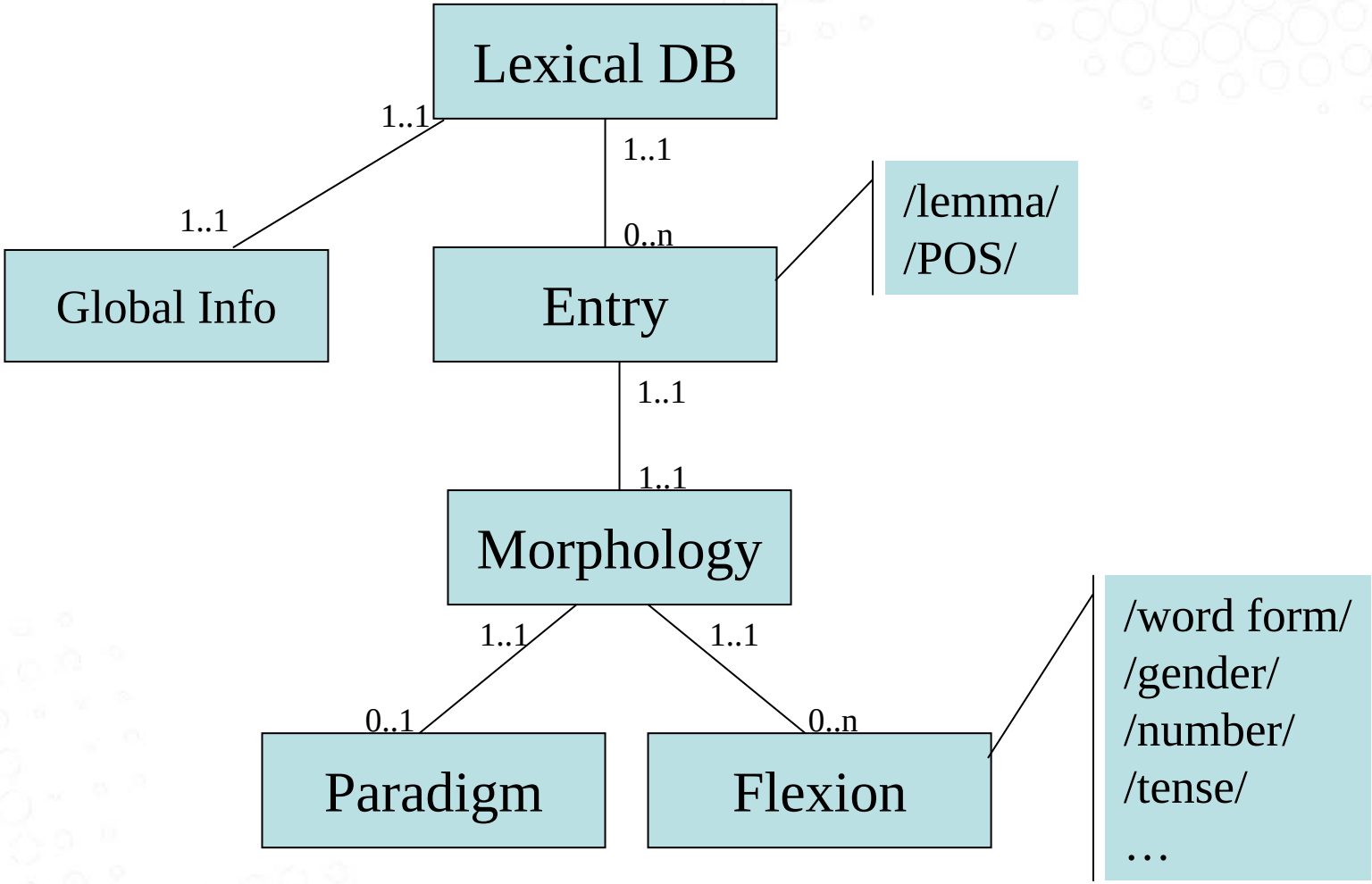




Meta-model for morphological description



Decorating the model



For those who want to see some XML?

```
<struct type='lexical entry'>
    <feat type='lemma'>chat</feat>
    <feat type='grammatical category'>noun</feat>
    <struct type='morphology'>
        <struct type='paradigm'>
            <feat type='paradigm identifier'>fr-s-plural</feat>
        </struct>
        <struct type='inflexion'>
            <feat type='word form'>chat</feat>
            <feat type='number'>singular</feat>
        </struct>
        <struct type='inflexion'>
            <feat type='word form'>chats</feat>
            <feat type='number'>plural</feat>
        </struct>
        ...
    </struct>
</struct>
```

Providing semantics through data categories

Entry Identifier: grammatical gender
Profile: morpho-syntax
Definition (fr): Catégorie grammaticale reposant, selon les langues et les systèmes, sur la distinction naturelle entre les sexes ou sur des critères formels (Source: TLFi)
Definition (en): Grammatical category… (Source: TLFi (Trad.))

Object Language: fr
Name: genre
Conceptual Domain: {/feminine/, /masculine/}

Object Language: en
Name: gender
Name: grammatical gender

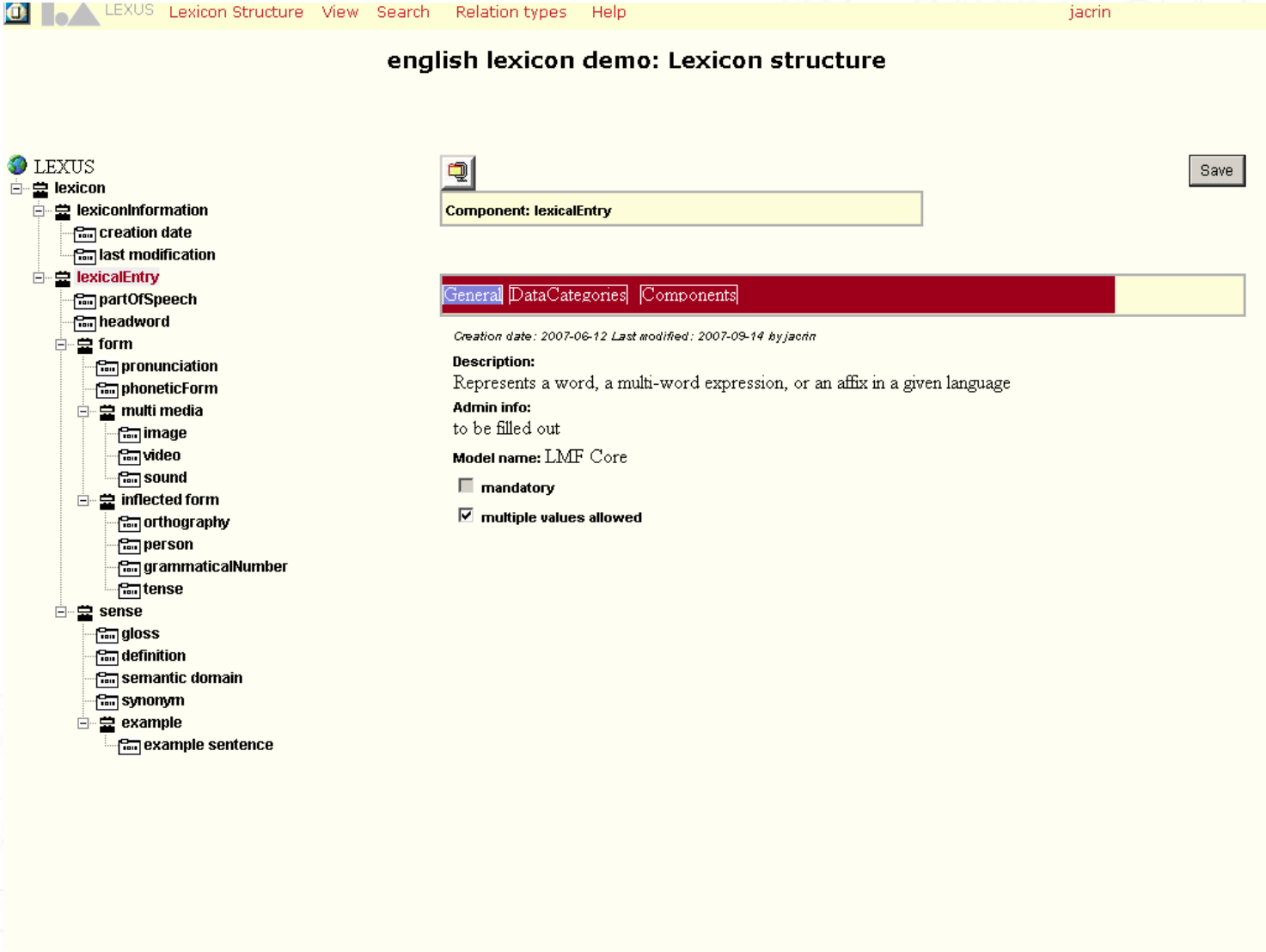
Object Language: de
Name: Geschlecht
Name: Genus
Conceptual Domain: {/feminine/, /masculine/, /neuter/}

Issue 2: Tools to make this transparent

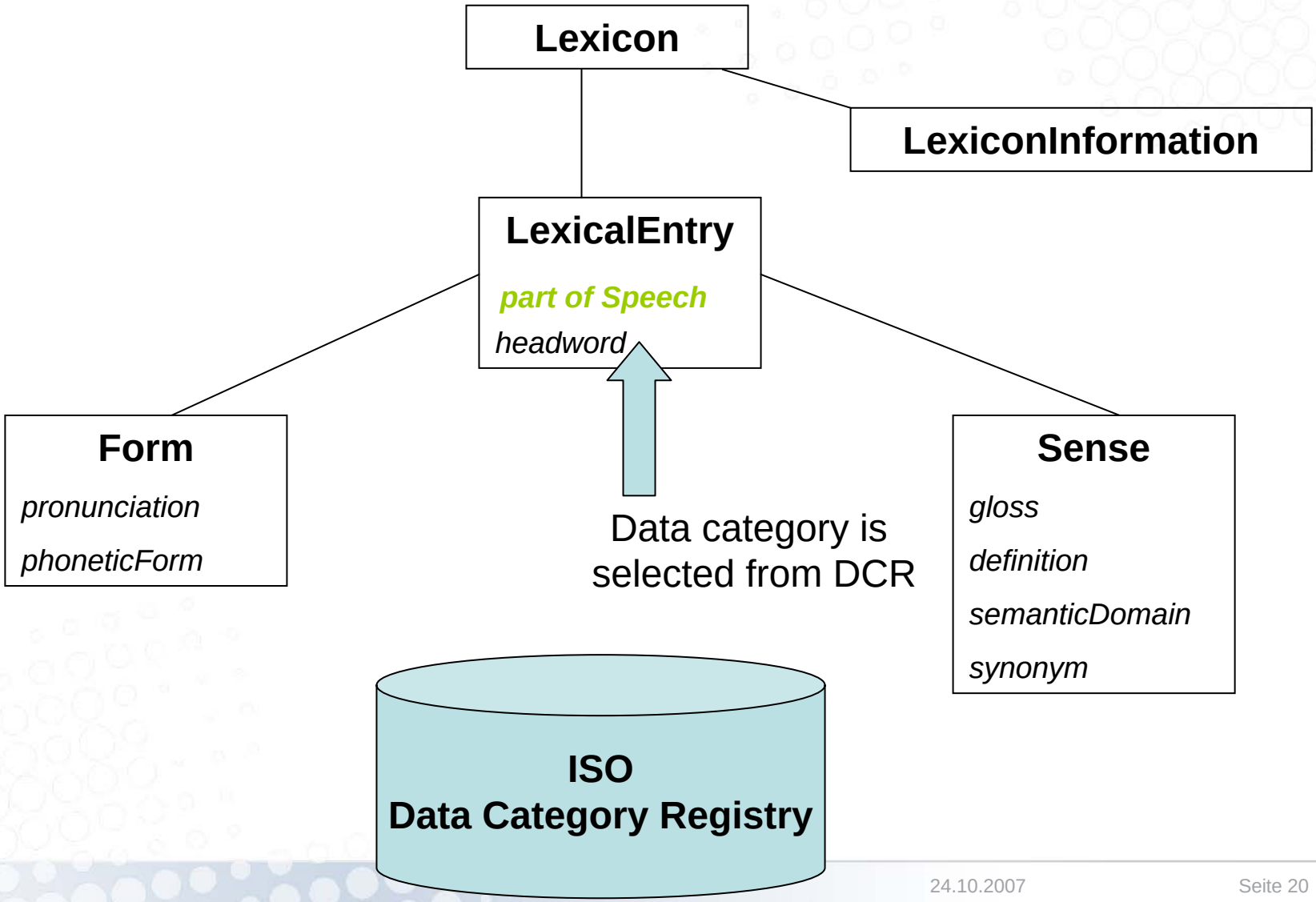
- Expected functionalities
  - Data modelling
  - Data management
  - Legacy data recovery

- Example: Lexus
  - On-line lexical data management tool
    - Implemented at MPI for Psycholinguistic, Nijmegen
  - Fully implements LMF
    - Uses TEI/ODD for XML schema specification

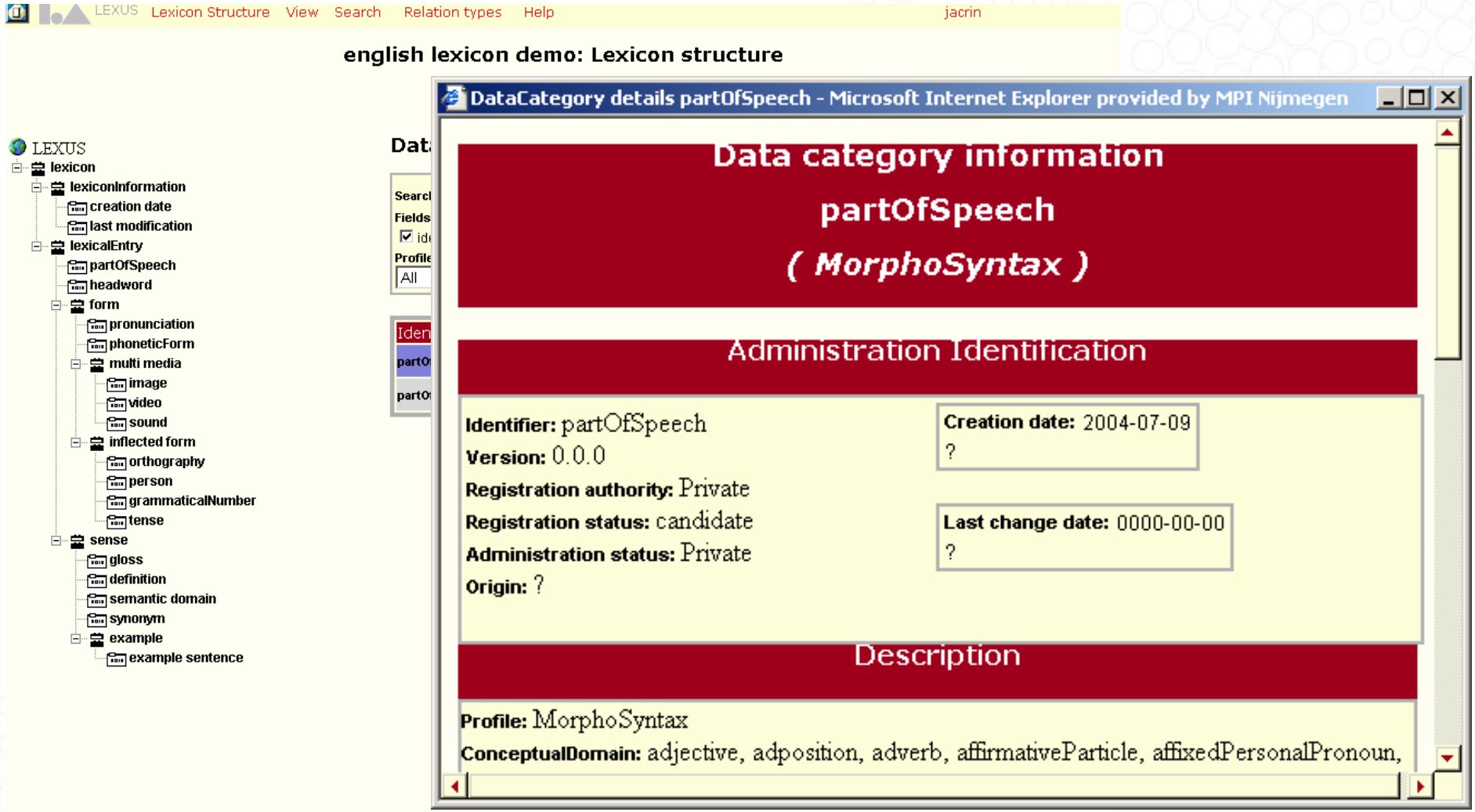
Data modelling



Data Category Usage Platform



Access to data categories



Integration in the model

Import from other formats(shoebox)

LEXUS Lexicon Search,.. Help Administration jacrin

Workspace of jacrin

Please select the type of lexicon you would like to import

- (•) Shoebox
- ( ) Clan
- ( ) any XML *Note: schema file required.*

Please specify whether you want to use a type file.

- (•) Create new lexicon
- ( ) Create new Lexicon no type file..

Shoebox lexicon schema and data import

This page allows you to import a shoebox lexicon. A new LexicalDatabase will be created for this lexicon.

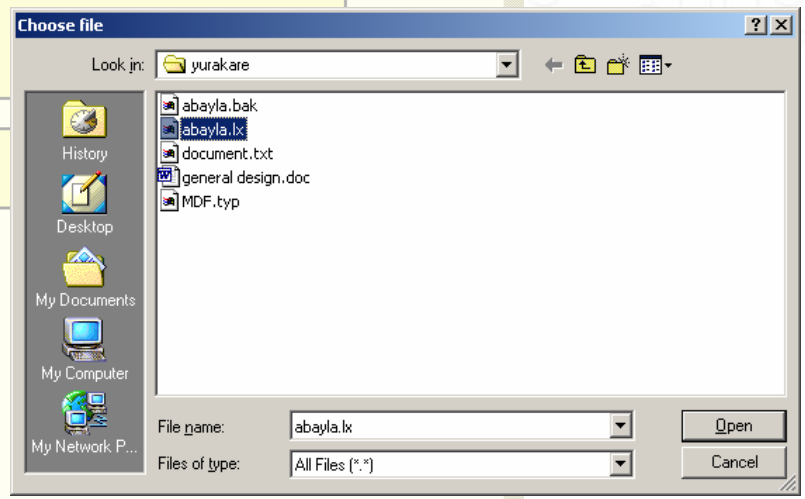
Please upload the Shoebox .typ structural file here. D:\marc\projects\lexicon\lexica\yurakare\MDF.typ Browse...

Please upload the Shoebox lexicon file here. Browse...

☐ **Allow me to restructure the shoebox model.**

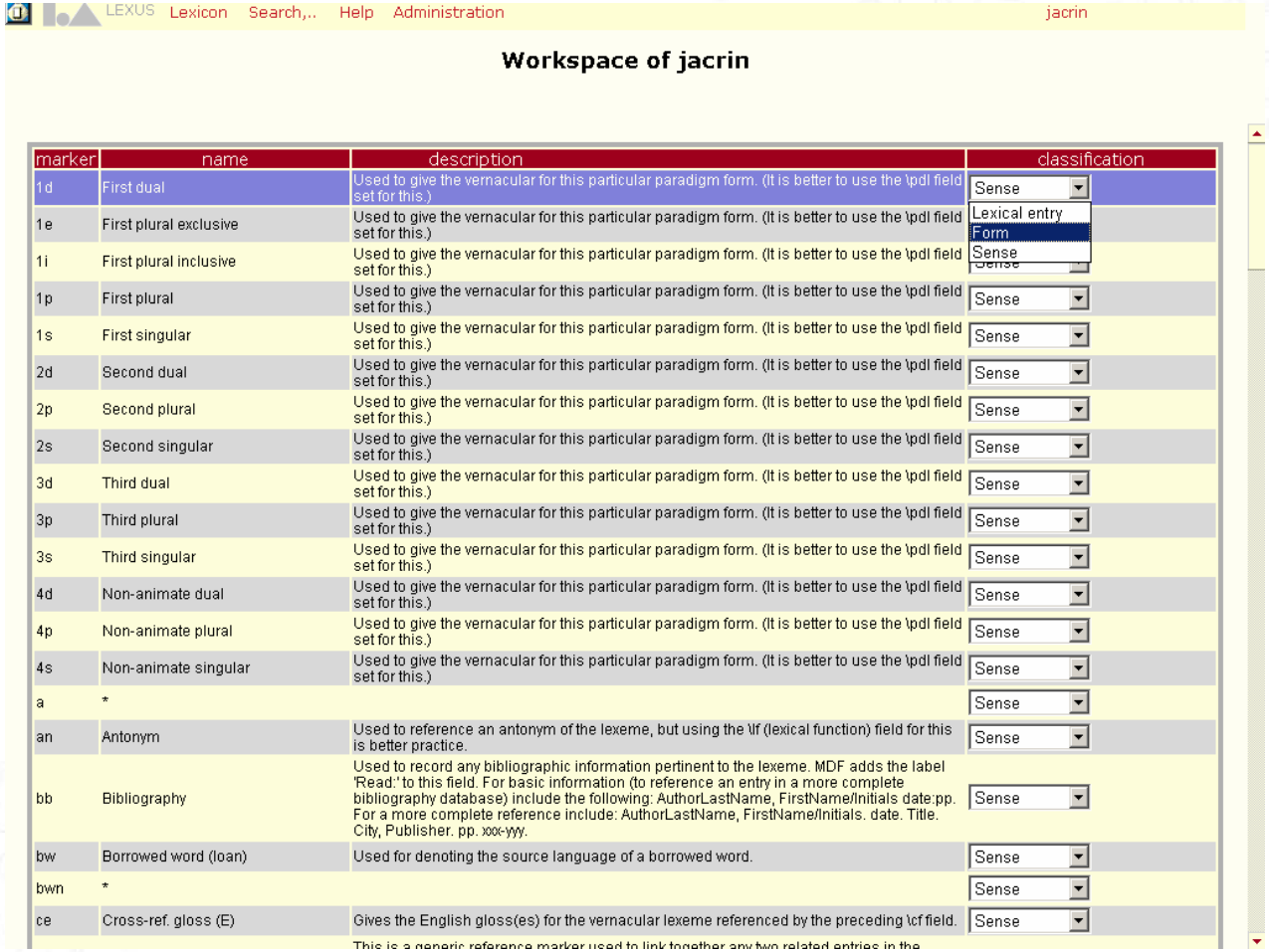
Import

Please note that the character encoding of your file is expected to be UTF-8 or ISO-LATIN-1.



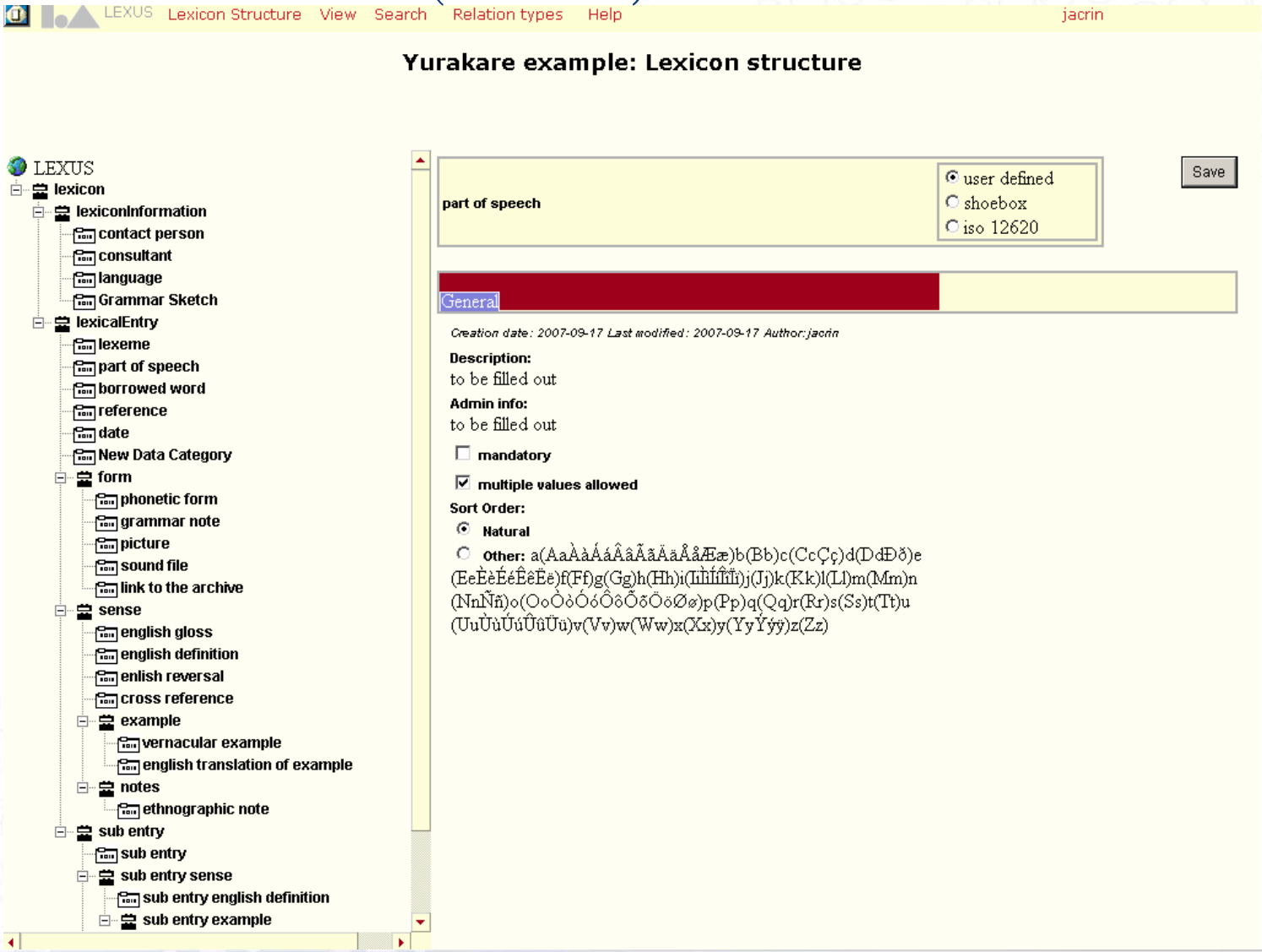
“Schema” and data files are imported

Import from other formats(shoebox)

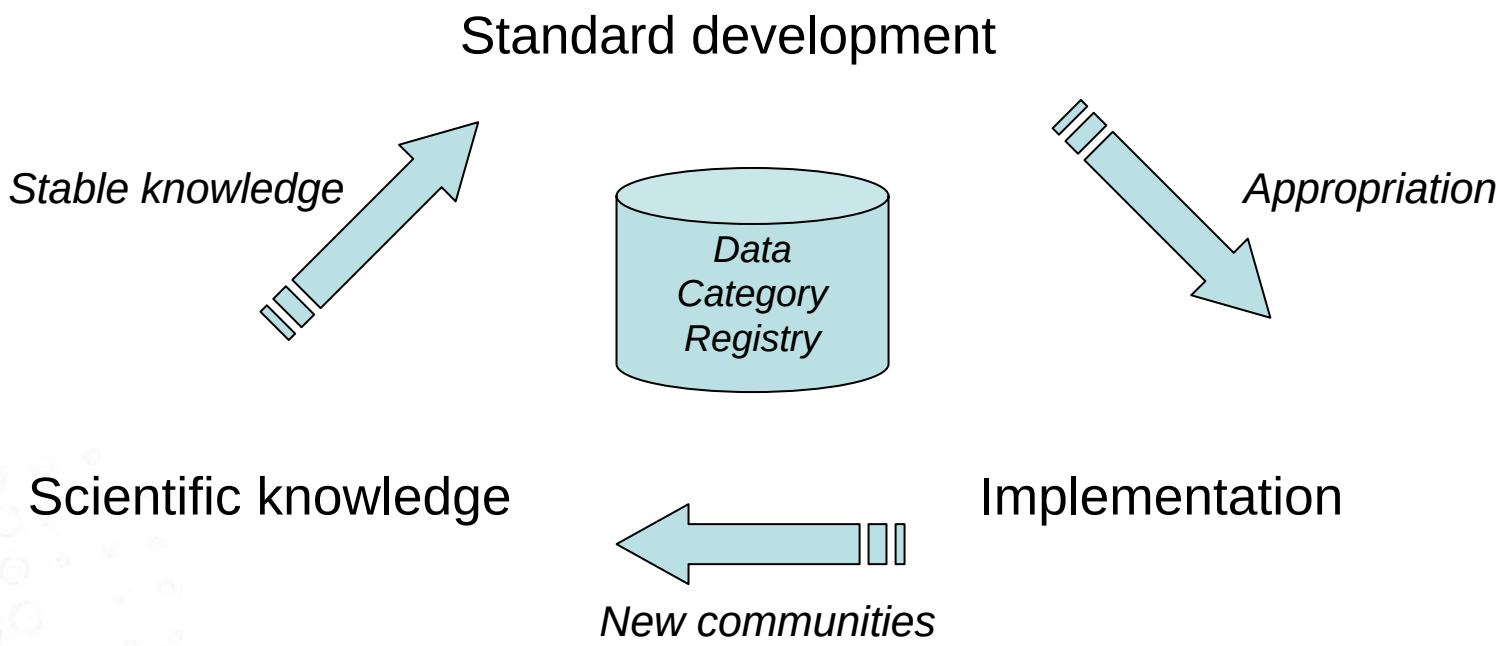


Shoebox schema is remodeled to fit LMF model

Import from other formats(shoebox)



Standards as an emanation from scientific knowledge



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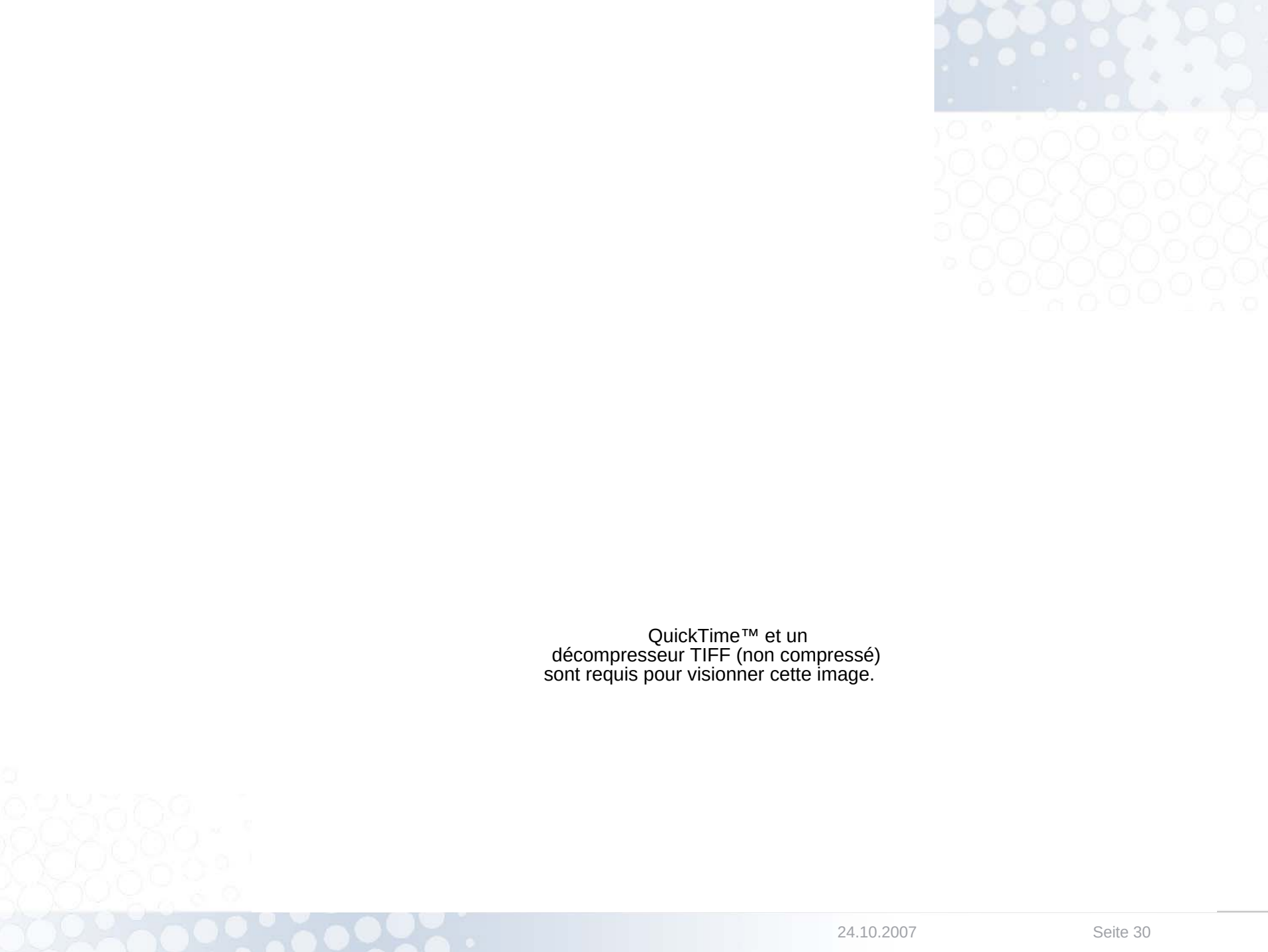
Gathering expertise — Colab

Issue 3: documenting the complexity

- Standards are necessary, but the picture is complex
  - Legibility of data
    - In space: sharing scientific sources with others
    - In time: pooling together the records of science
  - Generic standards (horizontal)
    - ISO 10646/Unicode, XML, etc.
  - Specific standards
    - ISO-IEC/JTC 1 (MPEG), ISO/TC 37 (ISO 639, TMF), TEI
  - E.g. TEI:
    - A wide range of documented elements for the encoding of textual data
    - A flexible architecture to select the elements adapted to one's needs

MPDL CoLaboratory (MPDL CoLab)

- Platform for community building and knowledge exchange
- Aim:
  - improve exchange of explicit knwoledge and make tacit and individual know-how explicit
- Supports community-building processes
  - Connects people with similar fields of interest and goals
  - within the MPS: MPDL, librarians, scientists
  - Outside: underlying basis of our national and international collaborations
- Provide information about existing standards and best practices in the domain of supporting scientific life cycles
  - Ensuring long-term compatibility between local and centralized initiatives within the MPDL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Issue 4: do we need libraries, or librarians

- Library as a place
  - Core reference monographies
    - Complementarity with centralized archives
  - Local management of primary sources
    - Selection, digitization, access
    - Library as digital curation centres
  - Centre of gravity of scientific information (cf. Bibliothek2007)

- Library as function
  - From information provision to information management
    - Identification of a “digital curator” profile: interface between scientists and scientific information
  - Local mirrors of central activities
    - We probably do need even more librarians…

Final words

- e-Infrastructures
  - We need them => which model fits which scientific community
- Communities
  - Sharing content and practices
- Helping scientist document the semantic of their data
  - Central role of data category registries
- Central-decentral (is it just a question for the MPS?)
  - A constant balance between contradictory forces
- Objective: simplicity for scientists