How GermaParl Evolves

Improving Data Quality by Reproducible Corpus Preparation and User Involvement

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KonsortSWD
Consortium for the Social, Behavioural, Educational and Economic Sciences

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The Need for a Reproducible Workflow for Corpus Creation

- large parliamentary text corpora are widely used
- being FAIR (Wilkinson et al. 2016) is increasingly intended
- data quality is crucial
- but not all flaws can be ruled out in large data collections

Requirement for large high-quality data: A process for evolving data quality with a reproducible data preparation workflow and community feedback as central building blocks

Outline

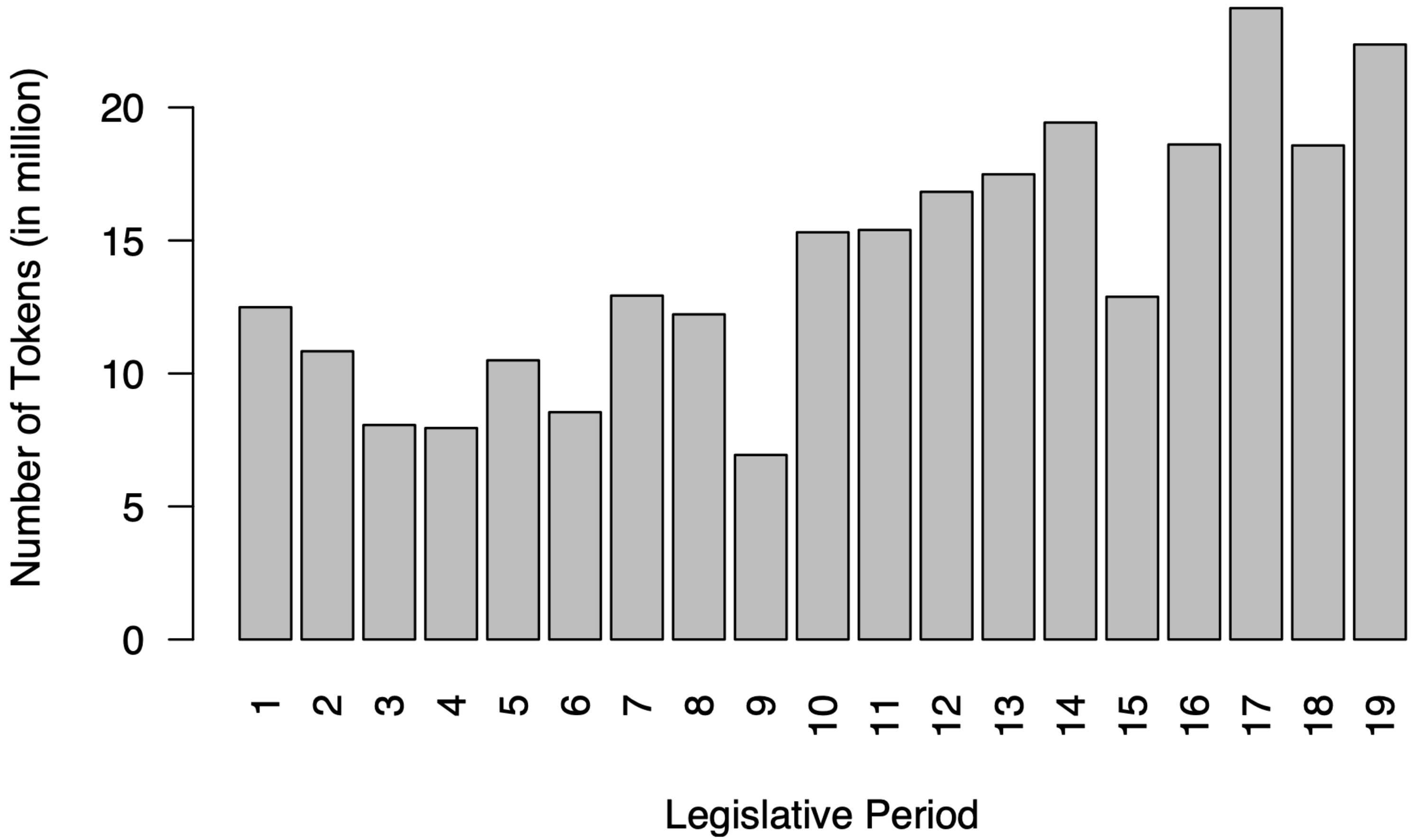
1. The GermaParl Corpus of Parliamentary Debates
2. A Reproducible Corpus Preparation Pipeline
3. Data Quality by Reproducibility and User Involvement

GermaParl: An Overview

- corpus of parliamentary debates in the German Bundestag
- released version: 1996 – 2016 (Blätte and Blessing 2018)
- **GermaParl v2: 1949 – 2021**
- Project Contexts
  - PolMine project (see also R package polmineR, Blätte 2020)
  - KonsortSWD and Text+
- not the only corpus of parliamentary debates in the German Bundestag
  - ParlSpeech (Rauh and Schwalbach 2020), DeuParl (Kirschner et al. 2021) or Open Discourse (Richter et al. 2020) (among others) as meaningful contributions
- but: GermaParl as a comprehensive, universally applicable and evolving resource

GermaParl v2: Comprehensive in Volume

- 19 legislative periods
- 72 years (1949 - 2021)
- 271 million tokens



Source: GermaParl

GermaParl v2: Comprehensively Annotated

- Structurally and linguistically annotated
- Structural Annotation (“structural attributes”):
  - mostly metadata
  - nested structures like named entities

Structural Attribute	Description
lp	legislative period
protocol_no	session number
date	date
year	year
speaker	speaker name
parliamentary group	parliamentary group of speaker
party	party of speaker
role	role of speaker
…	

Source: GermaParl, see Blätte et al. 2022, Table 2

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GermaParl v2: Comprehensively Annotated (cont.)

- Linguistic Annotation ("positional attributes"):
  - Word
  - POS-Tags
    - Universal Dependencies tag set
    - language specific STTS
  - Lemmata

cpos	word	upos	xpos	lemma
0	Meine	PRON	PPOSAT	Mein
1	Damen	NOUN	NN	Dame
2	und	CCONJ	KON	und
3	Herren	NOUN	NN	Herr
4	!	PUNCT	$.	!
		…		

Source: GermaParl, see Blätte et al. 2022, Table 3

A Reproducible Corpus Preparation Pipeline

- Size of data as a **challenge**
- **Reproducibility** an important aspect
  = the technical basis for a **feedback loop for quality control** during creation as well as after the initial release of a corpus

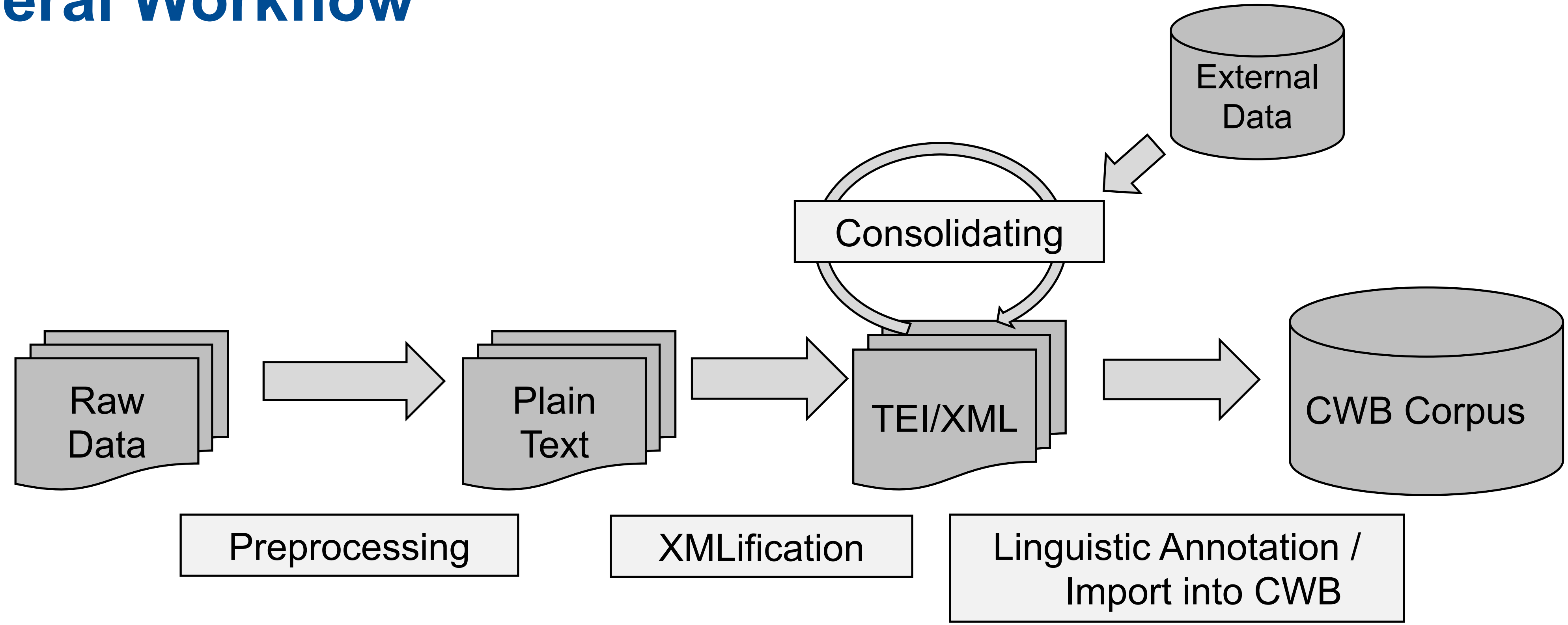
  ➢ Evolving Data Quality

General Workflow

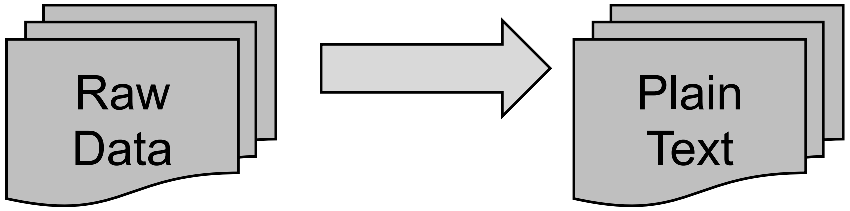
- **Goal:** An iterative workflow for corpus creation
- Successfully used in other corpus preparation processes, especially GermaParl (Blätte and Blessing 2018)
- Flexible, portable, local

- **Output formats:**
  - TEI-XML (sustainable, interoperable)
    - perspectively: ParlaMint format (Erjavec et al. 2022)
  - CWB Corpus (powerful corpus management and query tool, Evert and Hardie 2011)

General Workflow



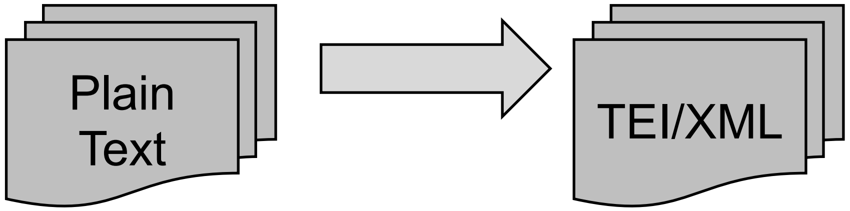
Preprocessing



- **Input / Raw Data:**
  - new parliamentary protocols retrieved from https://www.bundestag.de/services/opendata
    - (mostly unstructured) XML
    - PDF
- **Notes:**
  - existing GermaParl TEI added in consolidation step
  - Special Case 19th Legislative Period

- **Output:** Clean Plain Text
- **Steps:**
  - Removal of header and footer lines, removal of table of contents and appendices...

XMLification

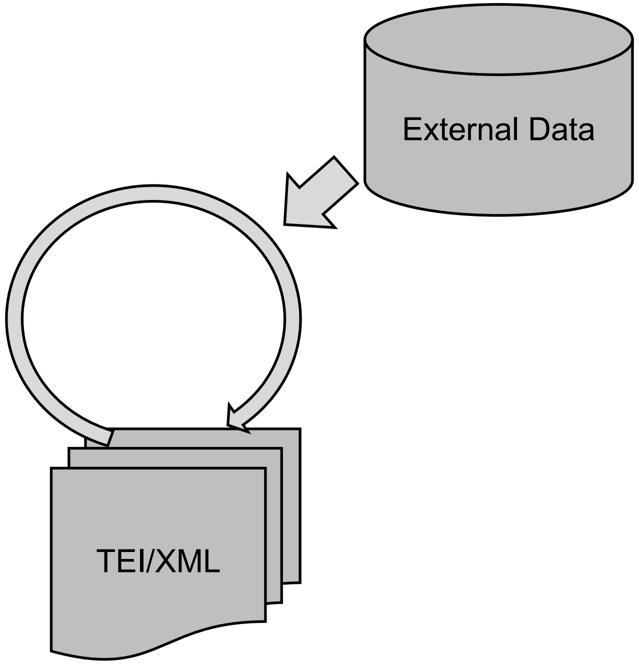


- Process to **reconstruct debate structure from unstructured text**
- Essential idea: a battery of regular expressions for speakers, interjections, etc.
- See Blätte and Blessing 2018

- Using the **Framework for Parsing Plenary Protocols** (frappp)
  - generic tool set, integrating standardized steps
  - further information and code examples: https://polmine.github.io/frappp_slides

Consolidating

- Initial correction of missing speakers and other flaws in the data
- Enrichment of speaker attributes not included in the protocols via external data sources (Wikipedia and the *Stammdaten* file of the German Bundestag (Deutscher Bundestag 2021))



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Consolidating

- *Wikipedia* for speakers' **party affiliations** and **full speaker names of speakers which are not members of parliament**
- *Stammdaten* file of the German Bundestag for **full speaker names of members of parliament**

```
<sp who="Adenauer" parliamentary_group="CDU/CSU" role="mp"
position="NA" party="CDU" name="Konrad Adenauer">
   <speaker>Dr. Adenauer (CDU/CSU) :</speaker>
   …
</sp>
```

(04/002.xml)

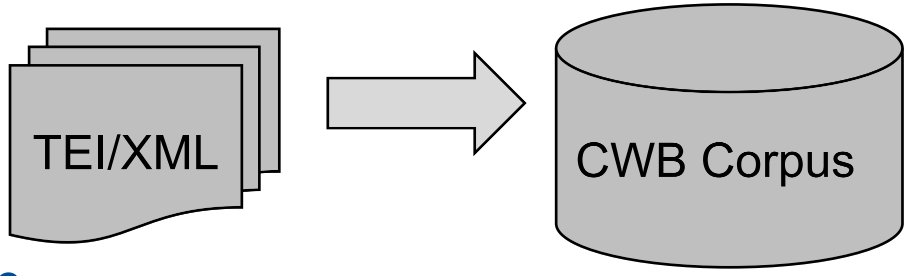
TEI-XML Output

- Available on **GitHub** for released data

(https://github.com/PolMine/GermaParlTEI/blob/master/13/BT_13_087.xml)


```xml
<?xml version="1.0" encoding="UTF-8"?>
<TEI>
  <teiHeader>
    <fileDesc>
      <titleStmt>
        <title>Plenarprotokoll</title>
        <legislativePeriod>13</legislativePeriod>
        <sessionNo>87</sessionNo>
      </titleStmt>
      <editionStmt>
        <edition>
          <package>ctk.plpr.bt.txt</package>
          <version>0.1.1</version>
          <birthday>2016-01-06</birthday>
        </edition>
      </editionStmt>
      <publicationStmt>
        <publisher>Deutscher Bundestag</publisher>
        <date when="">1996-02-09</date>
        <page/>
      </publicationStmt>
      <sourceDesc>
        <filetype>txt</filetype>
        <url>http://webarchiv.bundestag.de/archive/2005/1205/bic/plenarprotokolle/pp/1996/13087a.zip</url>
        <date>2015-10-20 19:19:06</date>
      </sourceDesc>
    </fileDesc>
    <encodingDesc>
      <projectDesc>PolMine-Project (www.polmine.de)</projectDesc>
      <samplingDecl/>
      <editorialDecl/>
    </encodingDesc>
    <profileDesc/>
    <revisionDesc/>
  </teiHeader>
  <text>
    <body>
      <div type="agenda_item" n="1" what="NA" desc="NA">
        <sp who="Dr. Rita Süssmuth" parliamentary_group="NA" role="presidency" position="Präsidentin" party="CDU" name="Rita Süssmuth">
          <speaker>Präsidentin Dr. Rita Süssmuth:</speaker>
          <p>Liebe Kolleginnen und Kollegen! Die Sitzung ist eröffnet.</p>
```

Linguistic Annotation and Import into the Corpus Workbench



- **Linguistic Annotation**
  - Segmentation into Tokens and Sentences (Stanford CoreNLP, Manning et al. 2014)
  - POS-Tagging (Universal Dependencies) (Stanford CoreNLP)
  - Named Entity Recognition (Stanford CoreNLP)
  - POS-Tagging (STTS) (TreeTagger, Schmid 1995)
  - Lemmata (TreeTagger)
- Used from within R (e.g., bignlp R package)

Linguistic Annotation and Import into the Corpus Workbench

- **Import into the Corpus Workbench (CWB)**
  - CWB as a fast corpus management and querying tool (https://cwb.sourceforge.io/)
  - Import via the cwbtools R package (on CRAN)

- **Dissemination** of linguistically annotated, CWB-indexed corpora
  - GermaParl stored on Zenodo
  - Beta Version of GermaParl v2 (1949-2021) currently as restricted access on Zenodo

Data Quality by Reproducibility and User Involvement

- **User Feedback** important to detect and remedy remaining flaws and bugs in the data
- **User Involvement** via
  - GitHub Issues
  - User Workshops
- **Reproducibility**
  - Feedback most useful when it can be incorporated into the data efficiently
  - Entire process fully reproducible
  - Transparency through Versioning/DOIs via Zenodo (for data) and GitHub

Release Plan of GermaParl v2.0

- Restricted Beta Release for interested persons (request access via Zenodo) in May 2022
- Issue-Only Repository on GitHub accompanies the release for feedback during beta phase
- User Workshop collects feedback on bugs, but also usability, convenience and further feature requests
- Full, public release in October 2022

https://zenodo.org/record/6539967

Conclusion

- **Contribution**
  - GermaParl as a large, comprehensively annotated resource
  - Thoroughly checked but flaws will remain, given its size
  - Reproducible, replicable data preparation as a precondition for high-quality data, especially in large datasets and corpora
  - Workflow facilitates this for GermaParl, allowing efficient user feedback
- **Next Steps**
  - Increasing interoperability by providing XML as ParlaMint corpus (Erjavec et al. 2022)
  - GermaParl as a basis for linkage to other types of data (“Linking Textual Data” within KonsortSWD)

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Text+ Logo: https://www.nfdi.de/wp-content/uploads/2021/12/Textplus-Logo-en.png

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Thank you for your attention!

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