Using GrAF for Advanced Convertibility of IGT data

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Overview

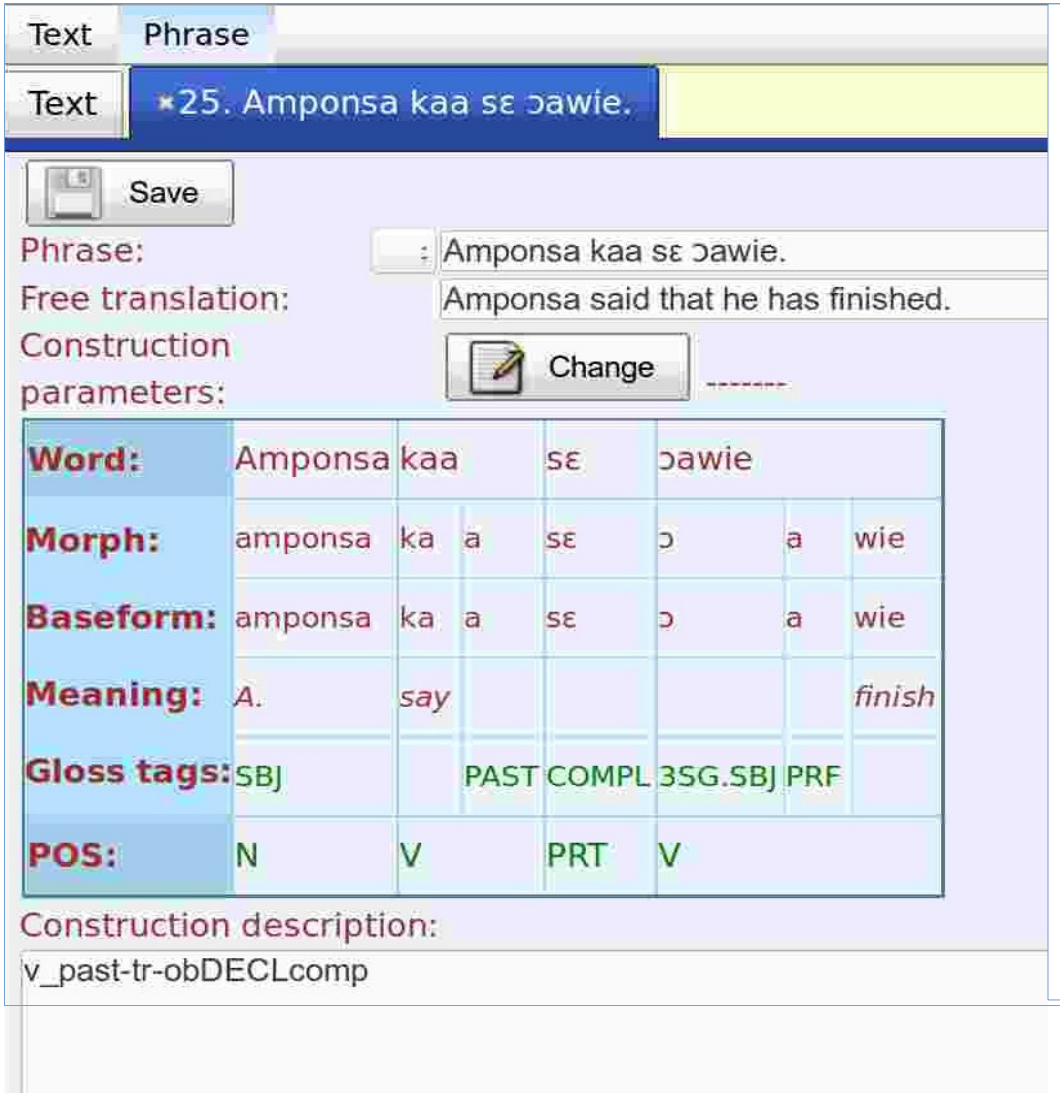
1. Interlinear Glossed Text (IGT)
2. The Whats and Whys
3. Implementation (GrAF: POIO API)
4. A case study
5. Software for Advanced Convertability
6. Future work

Interlinear Glossed Text (IGT)

IGT is the standard data format in the classical fields of linguistics. They are not only part of the electronic records that linguists have archived for endangered languages, linguists have also posted a large quantity of IGT as part of their publications online. Even more IGT are part of the printed media. The largest resource of structured text from less-resourced languages is IGT. IGT is omipresent, yet it is hard to process automatically.

Not that people haven't tried. An early attempt to make this data accessible is Lewis, W. D. (2003)

Interlinear Glossed Text from Akan [aka]



Me-ka-a sɛ Akosua re-didi.
I-say-COMPL COMP Akosua PROG-eat
'I said that Akosua was eating.'

COMP=Complementizer;
COMPL=Completive aspect;
PROG=Progressive aspect

(Amfo 2010)

Bow et. al (2003)

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Interlinear Glossed Text

IGT Editors

Toolbox: TXT, XML, WAV

(IGT and lexicon editor; single-user desktop system)

Elan: EAF, MPEG, WAV

(Multi-media editor; single-user desktop system)

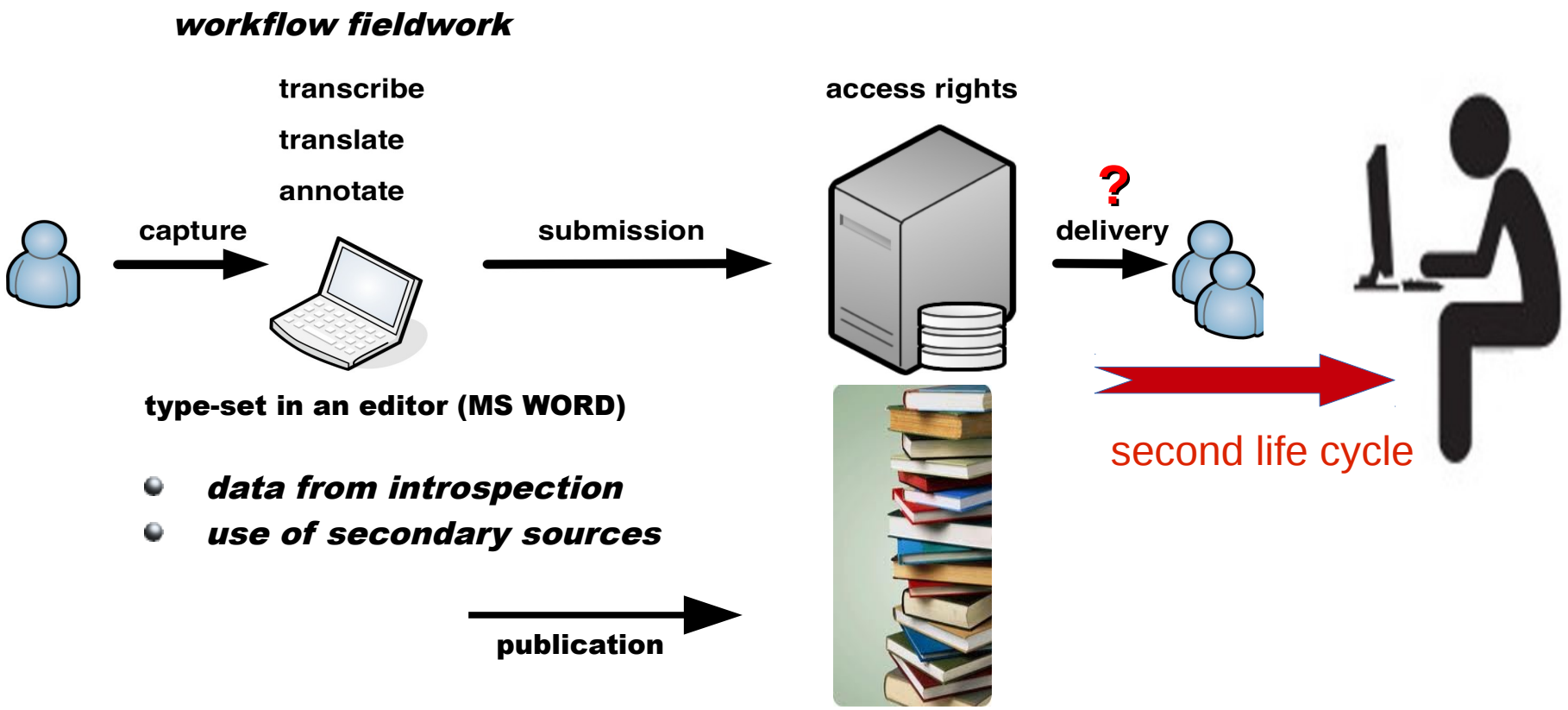
Typecraft: XML

(IGT editor and IGT bank; linguistic service)

The IGT manifold

Hard to tell how many, but perhaps the majority of IGT are created using MS WORD. The state of affairs is still that valuable linguistic data exist only as part of a linguistic publication.

Life cycle of Interlinear Glossed Text (IGT)



From de dicto to de facto standards our approach

Since the late 90ies we aim for

De dicto standards

through
'Best practice' guidelines

↓

Leipzig Glossing Rules

↓

De facto standards

↓

IGT-DATA MOBILITY

Work off the data types conventional in those linguistic communities engaged in the creation of IGT

* Language Documentation

→ Toolbox based IGT

* data-driven classical fields of linguistics

→ MS Word based IGT

Facilitate and promote IGT mobility by converting in and out of GrAF using: Poio API

Have a linguistic service as front-end(TypeCraft) and GrAF-based advanced converter as backend (POIO API)

GrAF Development of Linguistic annotation framework (LAF)

Graph Annotation Framework (ISO 24612)

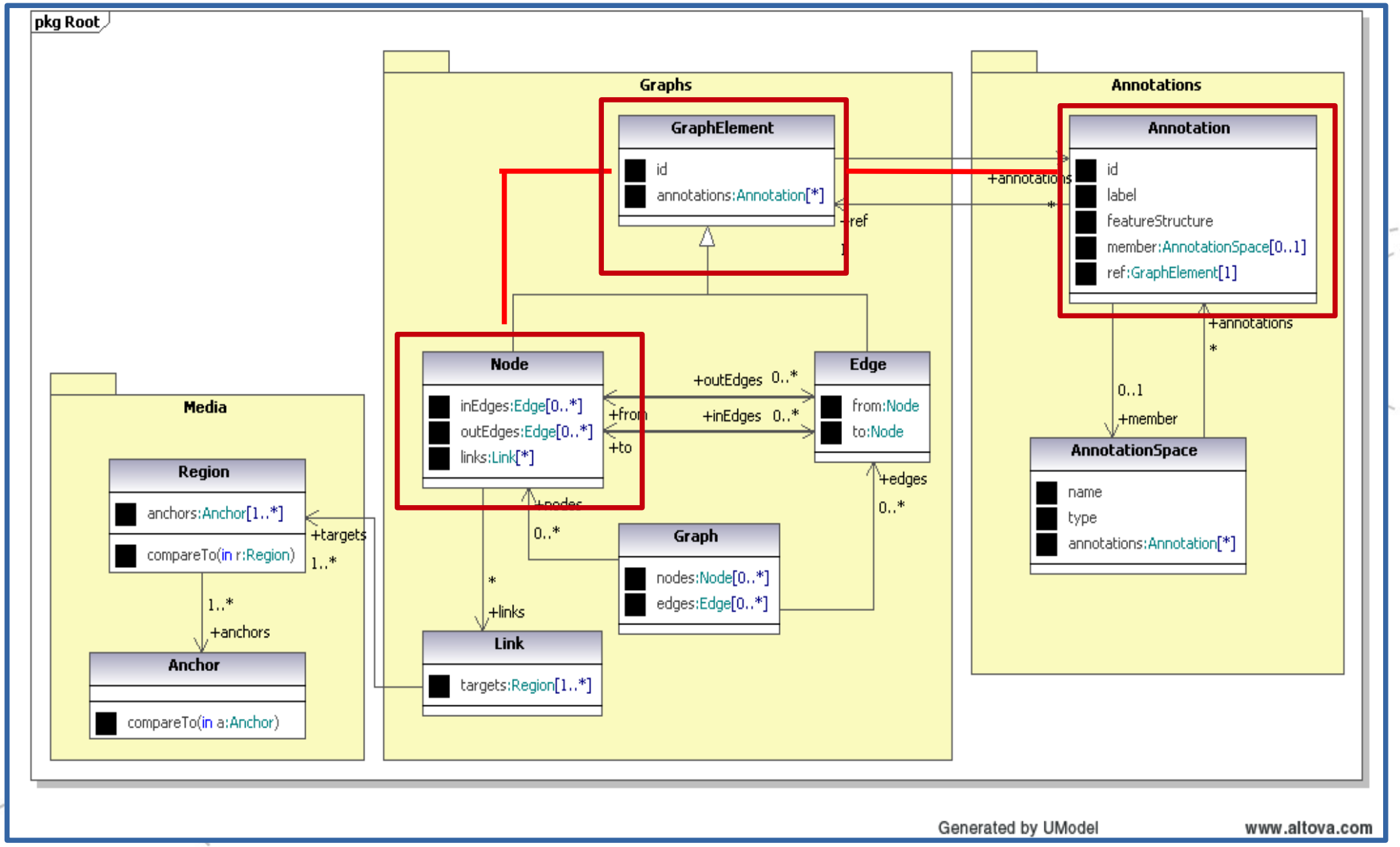
It allows language resource management

GrAF consists of:

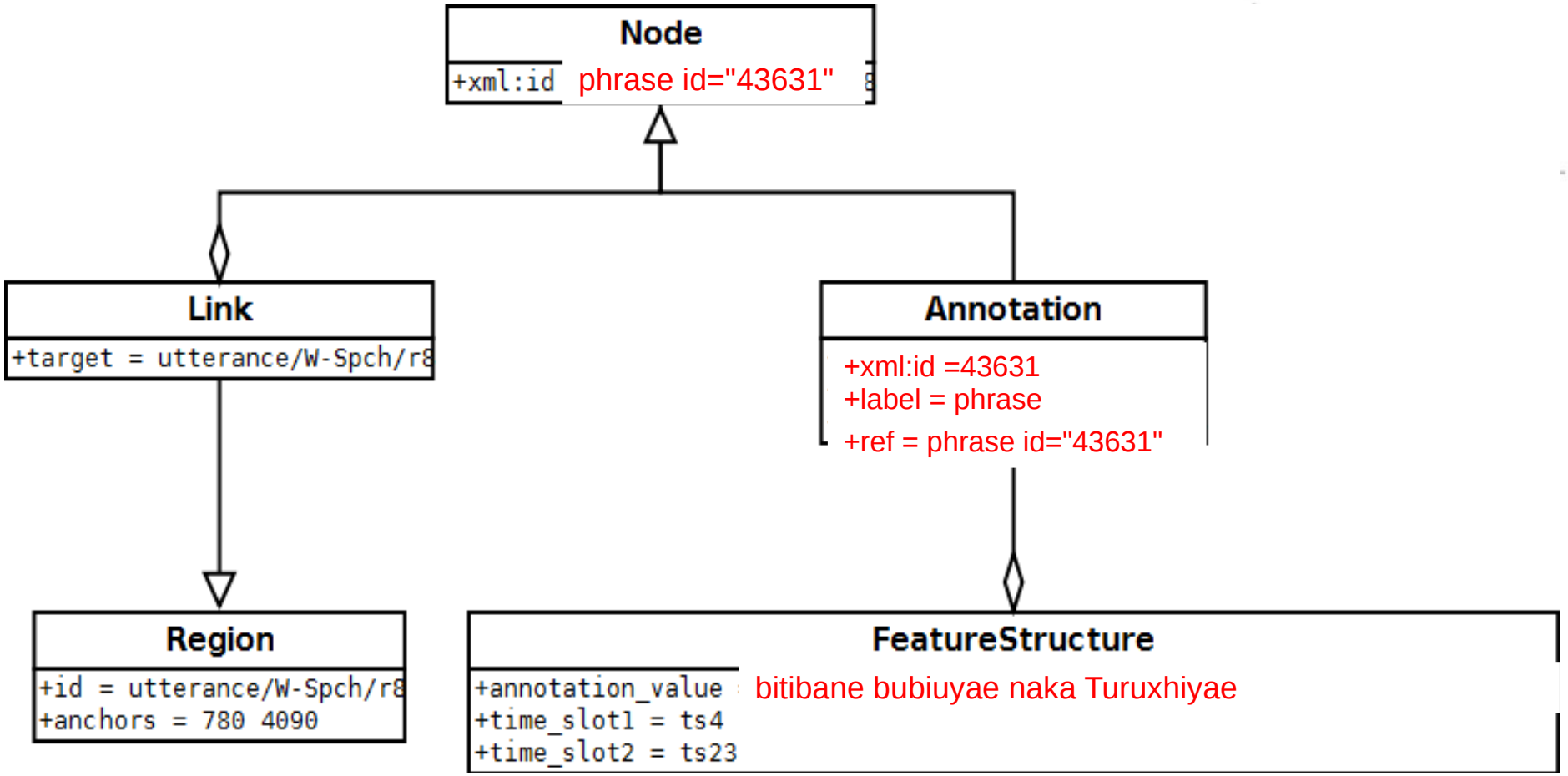
- An abstract data model (we come to that).
- An API for manipulating the data model.

  so we use an API and representations as data structures, not a file format
- An XML serialization of the data model is available.

GrAF Data Model



GrAF Data Model: Example



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poio

Think of GrAF as an assembly language for linguistic annotation; then Poio API is a libray to map from and to higher-level languages

Subset of GrAF to represent tier based annotation

- Interlinear glossed text (IGT)

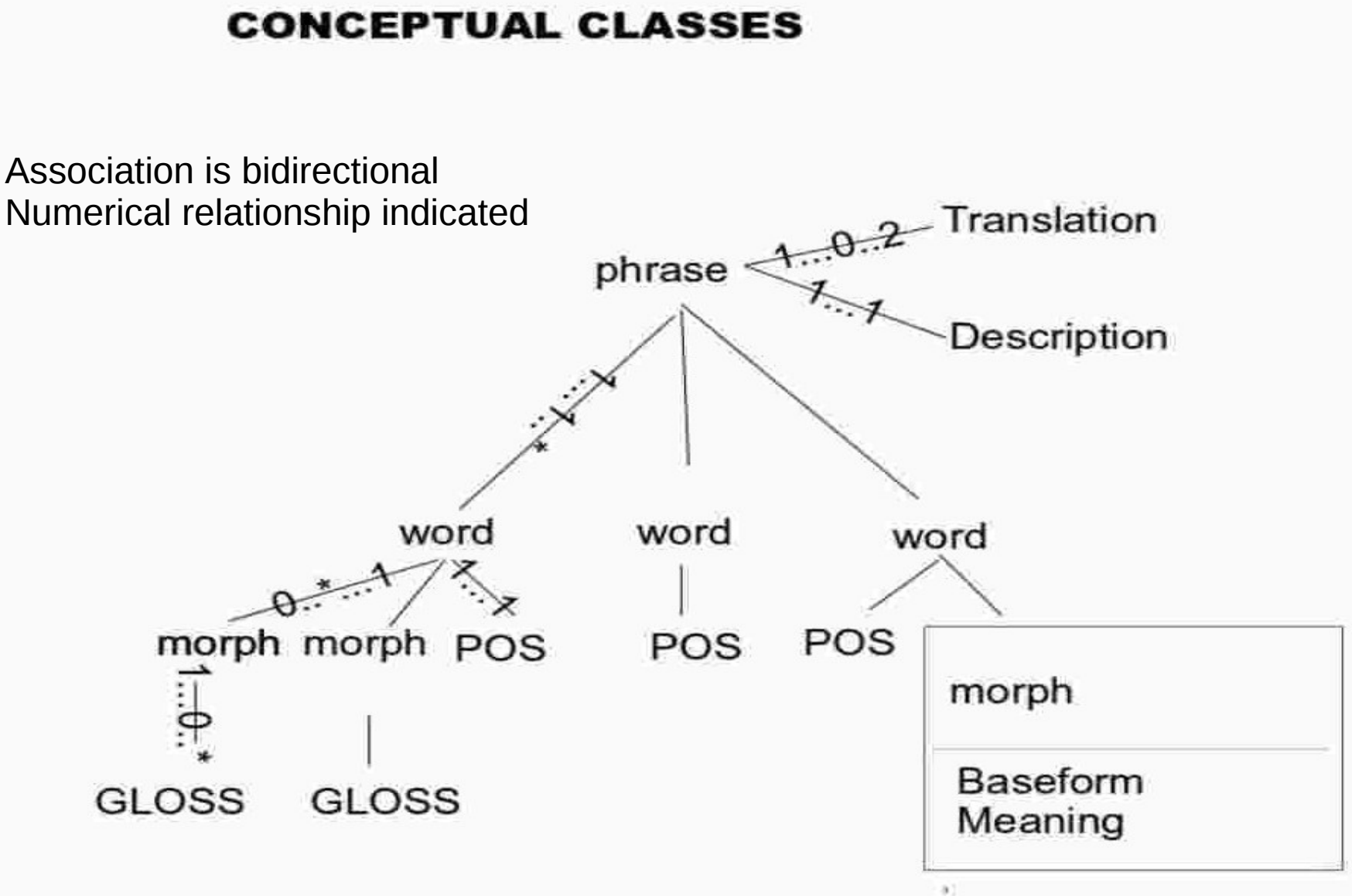
Filters and filter chains for regular expression searches on tiers

Plugin mechanism for file formats

- Mapping semantics: tiers and annotations to nodes and edges

Meta-data for additional information (Toolbox, Elan; TypeCraft tier types etc.)

TypeCraft - the target's data model



Reduced set of tiers

```
tier_map = {
    poioapi.data.TIER_UTTERANCE: ['phrase',
'utterance_gen'],
    poioapi.data.TIER_WORD: ['word', 't'],
    poioapi.data.TIER_MORPH: ['morph', 'm'],
    poioapi.data.TIER_POS: ['pos', 'p'],
    poioapi.data.TIER_GLOSS: ['gloss', 'g'],
    poioapi.data.TIER_TRANSLATION: ['translation', 'f'],
    poioapi.data.TIER_DESCRIPTION: ['descripion', 'nt']}
```

Advanced Convertability for Toolbox and MS Word based IGT to TypeCraft

Field work

Luguru (Kagulu) Language: [kki]

Tanzania (Bantu)

240 000 speakers

Archived Toolbox project (txt)

http://www.elar-archive.org/index.php

Malin Petzell, Africanist
Göteborg University

Language Documentation

influential work in language typology

Mandinka: [mnk]

Mali, Senegal, the Gambia, Guinea, Ivory Coast (Mande)

1.300 000 speakers

IGT based appendix to a book publication

Denis Creissels, Université Lumière (Lyon 2)

Member of the research team Dynamique Du Langage. Specialised in languages of Africa

Language Typology

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Luguru

\name mjs1 The hyena and the rabbit
\ref mjs3001revised
\t Baho katali difisi na
\m baho katali di- fisi na
\g DEM long time ago 5- hyena:5/6 CONJ
\p prn adv ncp- n conj

\t sungula hawowa mbuya kamei
\m sungula ha- wa- uw -a mbuya kamei
\g hare:9/10 PAST- 2- be -FV friend:1a,9/2,10 then
\p n tm- ncp- v -fv n adv

\t sungula kamgamba, "chigende nhambo."
\m sungula ka- m- gamb -a chi- gend -e N- tambo
\g hare:9/10 1.PAST- 1- speak -FV7- go -FV 9/10- journey:9/10
\p n sm- ncp- v -fvacp- v -fv ncp- n

\f A long time ago, the hyena and rabbit were friends, then rabbit told the hyena 'let us have a journey'.

Mandinka

ɪ táa-tá wǒ le ñáama fő ... súw-o kóno,
3PL aller-ACPP DEM FOC à_la_façon jusqu'à maison-D dans
Elles sont allées comme ça jusqu'à la maison,

i bée ye i la lóo-sít-óo boyi-ndi.
3PL tous ACPP 3PL GEN bois-attacher-D tomber-CAUS
et toutes les deux ont déposé leur fagot de bois.

Saa míŋ be maañóo la lóo-sít-óo kaŋ,
serpent.DREL COPLOC jeune_épouse.DGEN bois-attacher-D sur
Alors le serpent qui était sur le fagot de la jeune co-épouse

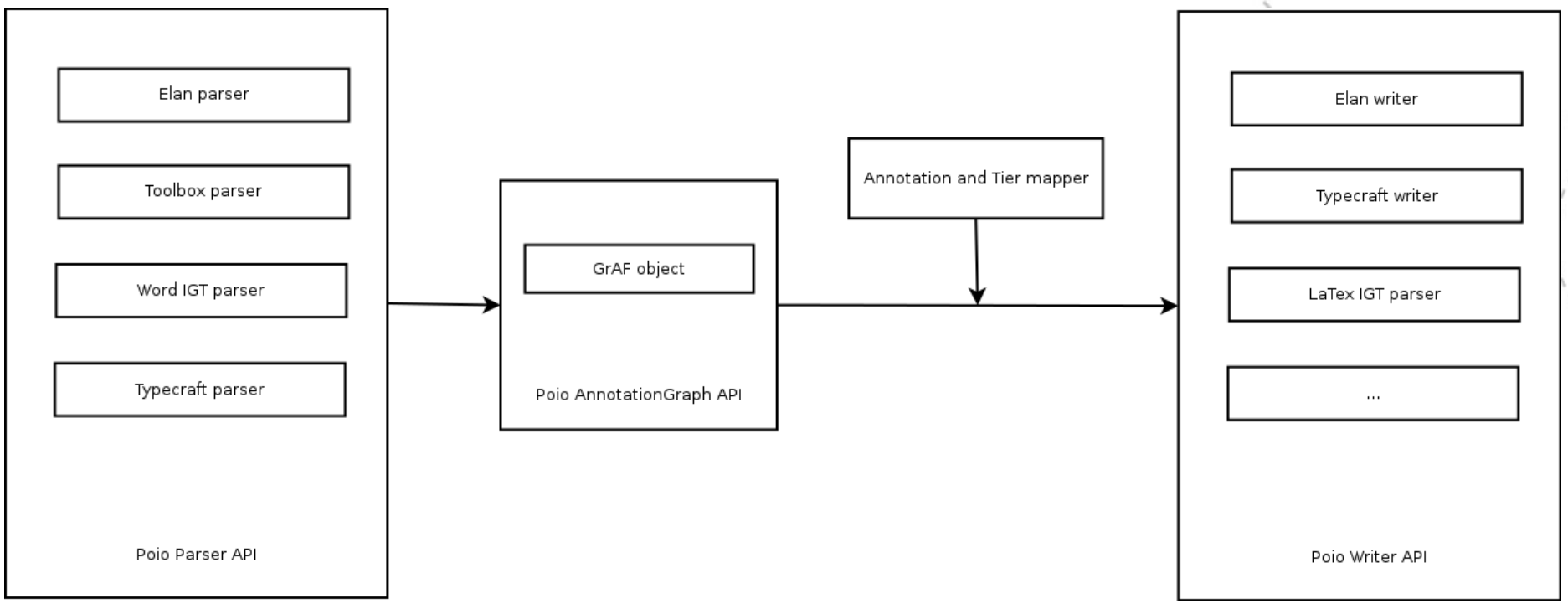
a murum-murun-tá naŋ, a yé musu-keebaa-máa kiŋ, cắpắt,
3SG tourner-tourner-ACPP CTRP 3SG ACPP femme-âgé-SELECT.D mordre ADVCL
s'est retourné, il a piqué la vieille,

Linguistic Analysis of the data

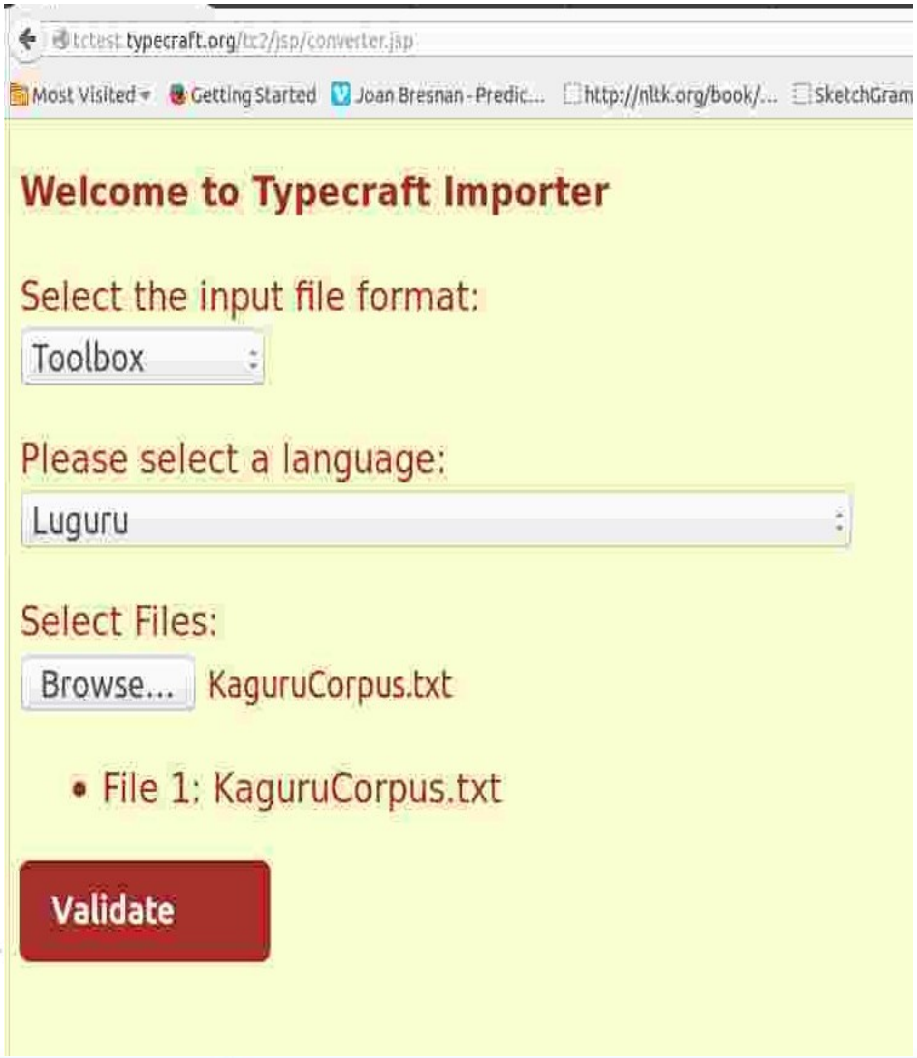
Incoming data recognises mostly the same linguistic Categories which however are not bound to a designated tier (different tiers, several tiers). Categories might be distinguised by typographical means. Inter- and intra-annotator disagreement is frequent

Category	Example	Specification
text	*ɪ táatá wǒ le ñáama fő ... súwo kóno*	
word	*táatá*	
morph	*táa-tá*	Type1: stem Type2: affix Type3: clitic
trans. gloss	*aller* *à_la_façon*	Type1: word-word Type2: word-phrase
symb. gloss	*ACPP*	Type1: word gloss Type2: morph gloss
POS	*DEM*	
free trans.	*Elles sont allées comme ça jusqu'à la maison*	

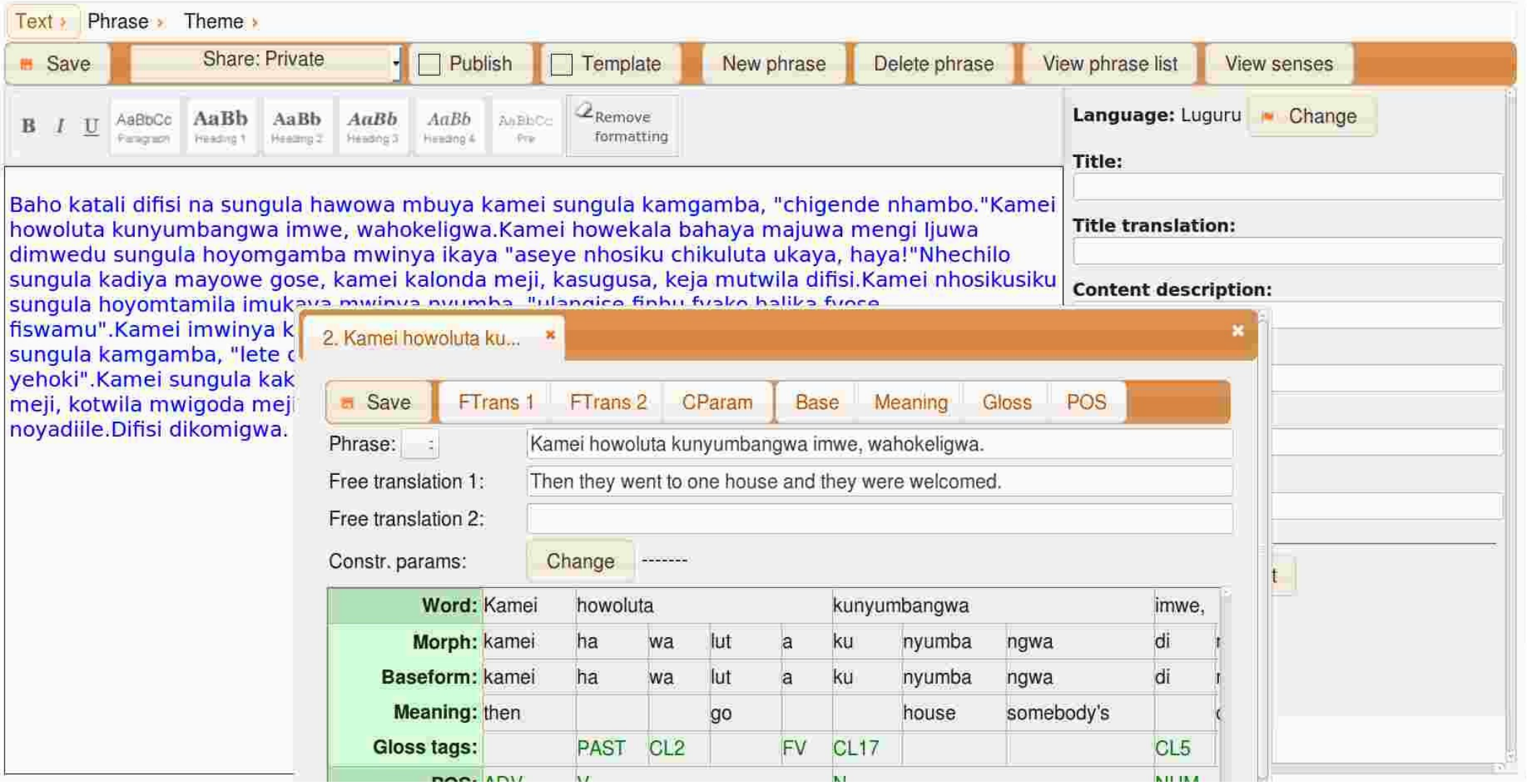
poio


Elan parser
Toolbox parser
Word IGT parser
Typecraft parser
Poio Parser API
GrAF object
Poio AnnotationGraph API
Annotation and Tier mapper
Elan writer
Typecraft writer
LaTex IGT parser
...
Poio Writer API

TypeCraft Importer



Luguru seen in the TypeCraft Editor



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Future work

ELAN - TypeCraft - bilateral exchange of data

Integration of TypeCraft's tier and annotation inventory into ISO CAT

Converter: TODO

- make converter more stable
- improve user dialog

Links

Poio:

http://media.cidles.eu/poio/

GrAF:

http://www.xces.org/ns/GrAF/1.0/

TypeCraft
http://www.typecraft.org

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Beermann, Dorothee; Mihaylov, Pavel. (2013) TypeCraft collaborative databasing and resource sharing for linguists. *Language Resources and Evaluation.* Springer. The Netherlands

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Thank you
research
IGT-based
Glossed
different
data
annotated
exchange
distribution
classical
use
fields
linguistic
IGT
Facilitating
Interlinear
linguistis
creation