Further development of a web application for the annotation of specific linguistic features

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Motivation

- Many children with reading and writing disorders
- Recognition of syllable important
- Syllable-based reading exercise can help
- Web application considered that generates such exercise texts
- Aimed to help therapists, teachers, parents and children

Starting position

- COAST: Web application that was developed with the previously described motivation
- Problem: It only supports German, some more helpful functions (dictionary, audio pronunciation) can be added and the usability can be improved

Tasks

- English support using CELEX2 (that was used for German)
- Dictionary Service (Definition function & Audio pronunciation function)
- Other modifications to improve usability

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Dictionary Service

- Definition function
- Audio pronunciation function
- For analyzed text (in the pop-up annotation)
- Separate dictionary service for free look-up

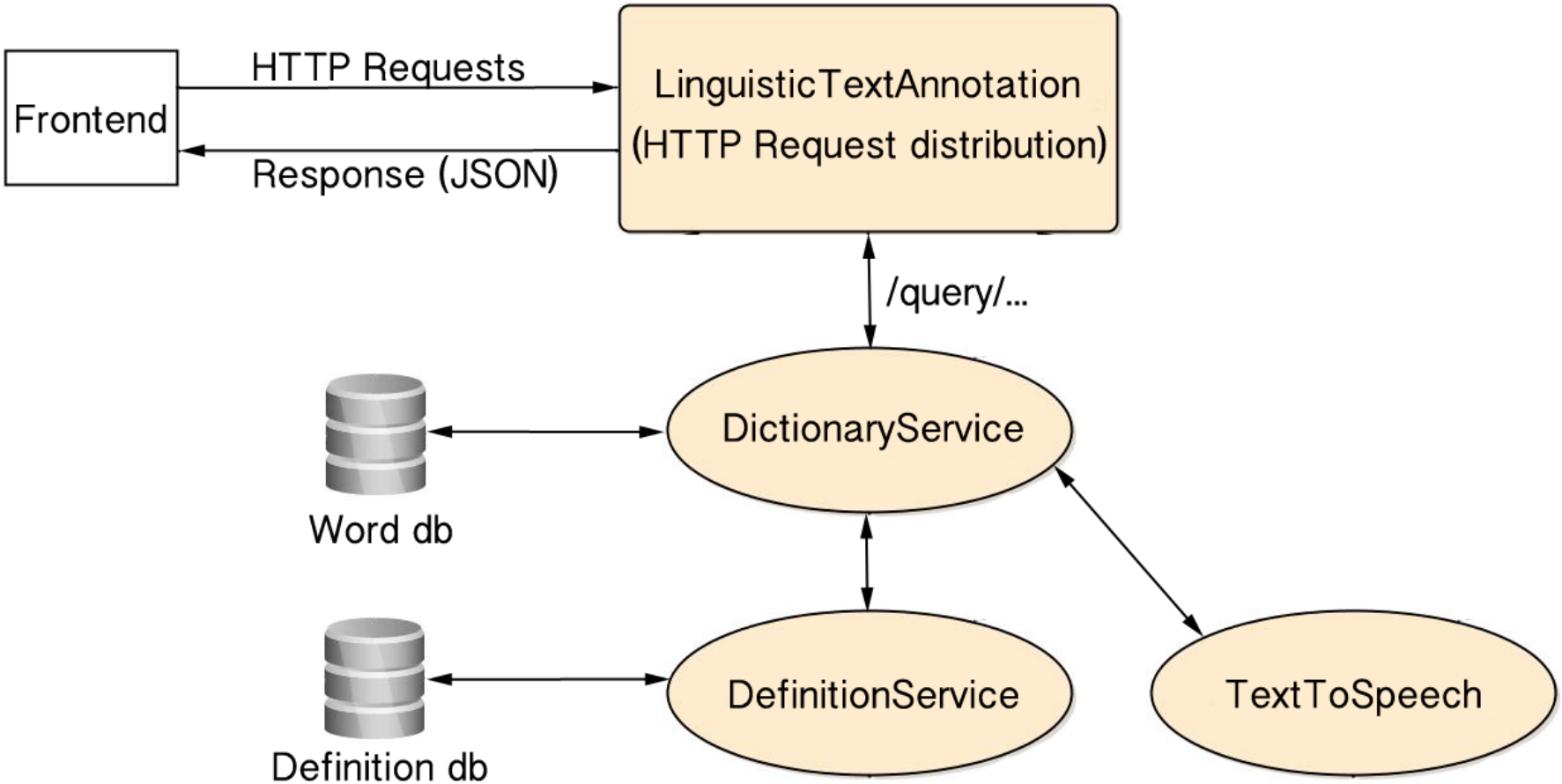
Definition function

- WordNet: Lexical database of English from Princeton University Department of Computer Science
- WordNet as words' definition database
- Database creation using SQLAlchemy
- Python script 'DefinitionService' to get definition and synonyms
- For frontend, 'dictionary' function to send HTTP Request

Audio pronunciation function

- Included in dictionary service
- gTTS (Google Text-to-Speech) python library
- Audio data is binary
- For HTTP Request json format is used
- Json doesn't directly support binary data
- String $\rightarrow$ MP3 file $\rightarrow$ Audio data (binary) $\rightarrow$ String in Base 64

Dictionary Service backend



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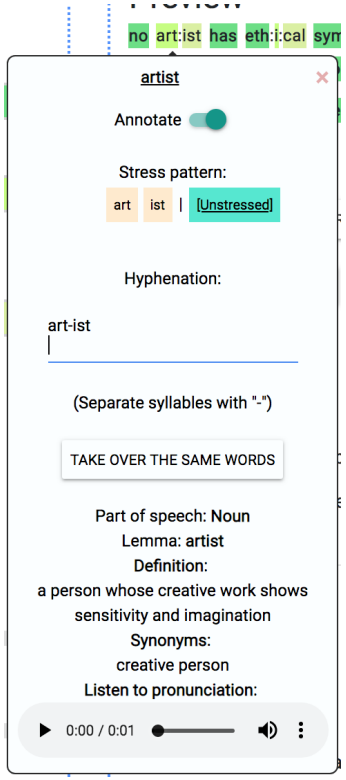
English text generation

No artist has ethical sympathies . An ethical sympathy in an artist is an unpardonable mannerism of style . Thought and language are to the artist instruments of an art . Vice and virtue are to the artist materials for an art .
Diversity of opinion about a work of art shows that the work is new , complex , and vital . When critics disagree , the artist is in accord with himself .

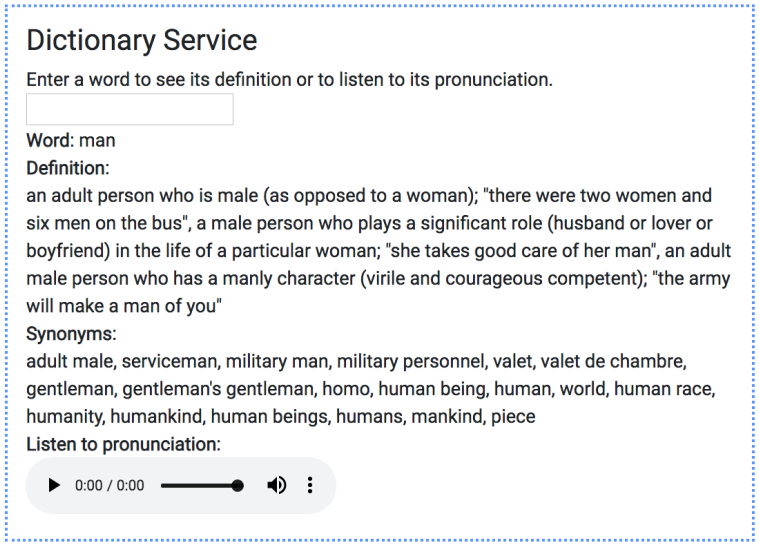
No art-ist has eth-i-cal sym-pa-thies . An eth-i-cal sym-pa-thy in an art-ist is an un-par-don-able man-ner-ism of style . Thought and lan-guage are to the art-ist in-stru-ments of an art . Vice and vir-tue are to the art-ist ma-te-ri-als for an art .
Di-ver-si-ty of o-pin-ion a-bout a work of art shows that the work is new , com-plex , and vi-tal . When crit-ics dis-a-gree , the art-ist is in ac-cord with him-self .

Dictionary service

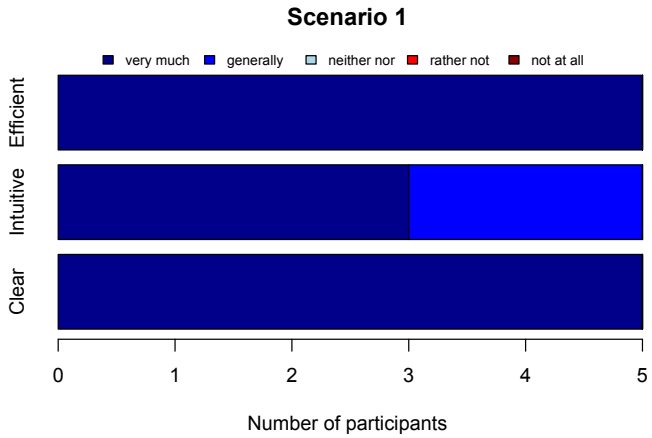
on annotation

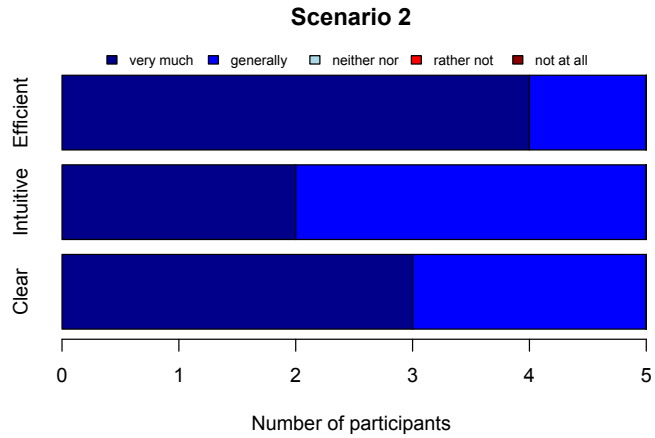


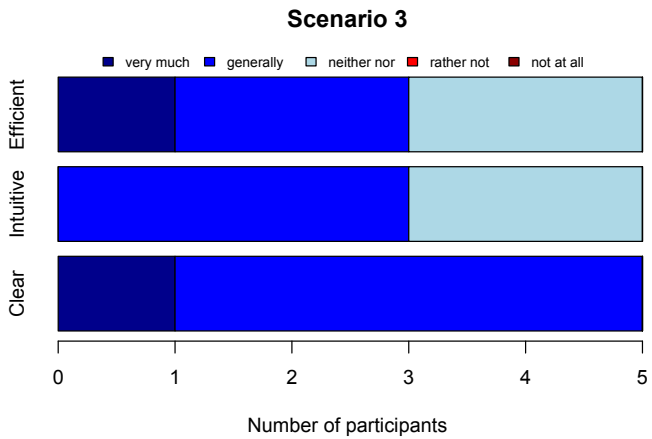
separate service

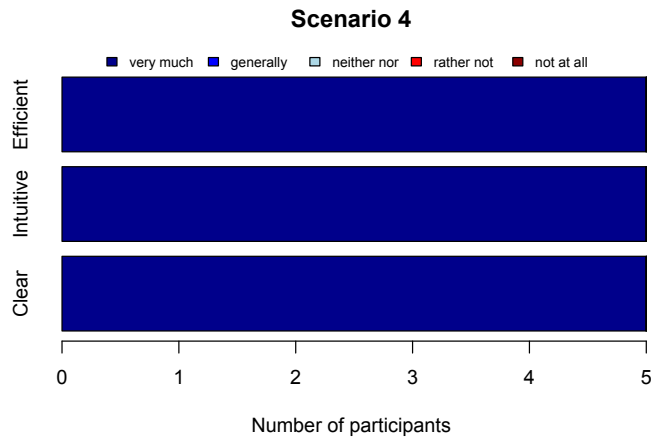


User test


Scenario 1
very much
generally
neither nor
rather not
not at all
Efficient
Intuitive
Clear
0
1
2
3
4
5
Number of participants


Scenario 2
very much
generally
neither nor
rather not
not at all
Efficient
Intuitive
Clear
0
1
2
3
4
5
Number of participants


Scenario 3
very much
generally
neither nor
rather not
not at all
Efficient
Intuitive
Clear
0
1
2
3
4
5
Number of participants


Scenario 4
very much
generally
neither nor
rather not
not at all
Efficient
Intuitive
Clear
0
1
2
3
4
5
Number of participants

Conclusion

- Generation of English exercise texts successful
- Usability improved through modifications
- Font settings can be more approachable
- Further development in other languages possible
- Word database can be extended

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How to deploy

- Install Python3, Flask, SQLAlchemy, SQLite, Pyphen, Spacy, gTTS on the server
- Deploy the backend
- Adjust variable SERVER_URL in app_service.dart
- Make the frontend deployable using command 'webdev build' and deploy the files under build/web directory (See here and here for more information.)

Thanks for your attention!
Questions & Live-demo