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A Fast and Flexible Webinterface for Dialect Research in the Low Countries

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Abstract
This paper describes the development of webportals with search applications built in order to make the data from the 33 volumes of the Dictionary of the Brabantic dialects (1967-2005) and the 39 volumes of the Dictionary of the Limburgian dialects (1983-2008) accessible and retrievable for both the research community and the general audience. Part of the data was available in a digital format, a larger part only in print. The printed data was semi-automatically converted from paper to structured text (database). This process allowed for streamlining information, applying (semi-)automatic data checks and manually correcting the input. Next, the resulting database was the backbone of a webportal for faceted search requests on the full collection, including filtering and splitting the results on metadata. The design and implementation of the webportals, called e-WBD and e-WLD, are being defined in more detail. The URLs of the portals are: http://e-wbd.nl/ and http://www.e-wld.nl/.

Keywords: web services; data curation; dialects

1. Introduction
The 33 volumes of the Dictionary of the Brabantic dialects (Woordenboek van de Brabantse Dialecten, WBD) have appeared in press between 1967 and 2005, while the 39 volumes of the Dictionary of the Limburgian dialects (Woordenboek van de Limburgse Dialecten, WLD) were published between 1983 and 2008. The WBD and WLD have been compiled at the Radboud University Nijmegen and at the University of Leuven and both dictionaries started under the guidance of the famous Dutch dialectologist A.A. Weijnen.1 The Dictionary of the Flemish Dialects (Woordenboek van de Vlaamse Dialecten, WVD) was set up according to the same semantic principles, but started later.

The Limburgian dialects are spoken in the provinces of Limburg in the Netherlands and Belgium. The dialects are separated into six dialect areas, as shown in Figure 1.

The same goes for the Brabantic dialects: the dialects are spoken in the Dutch province Northern Brabant, the Belgian provinces Antwerp and Flemish Brabant, and the Brussels-Capital Region, as can be seen on Figure 2. More details can be found in WBD, part III, volume Inleiding & Klankgeografie (2000).

The WBD and WLD are onomasiologically organized. The main entries are semantic concepts, represented in Standard Dutch (the lemmas). These entries contain the keywords that are dutchified transliterations (normalized spellings) of the dialect forms. The next level gives the phonetic transcription forms (the dialect forms). For each transcription form the location or locations are given where they are used.

Overall, the dictionaries consist of three parts. The first part (WBD 9 volumes, including one devoted to introductory matters; WLD 13 volumes) contains the agricultural terminology. The second part (WBD 9 volumes; WLD 12 volumes), concerns the technical terminology (industries, trades), and finally the third part (WBD 15 volumes, including one devoted to introductory matters; WLD 14 volumes) enumerates the general vocabulary.

Figure 1. The six Limburgian dialect areas

Unique for Limburg was the mining industry. WLD dedicated a special volume to the vocabulary used in the 19 coal mines in the two Limburgian provinces. The 12 Dutch mines were closed in the 1960s and 1970s, and in the 1990s the 7 Flemish mines followed, making the mine jargon obsolete. In the mines a special, mixed form of dialects was

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1 A complete overview of all volumes can be found at http://www.e-wld.nl/delen and http://e-wbd.nl/delen
The mine workers came from far and wide and spoke different Limburgian dialects, but also other Dutch, Flemish, German or Walloon dialects, and there were even workers from, among others, Italy, Poland and Brazil. In Dutch mining terminology, Ger</p>

2. Set-up of the Webportal

Figure 4 shows the main elements of a dictionary entry as presented in the volumes.

Figure 4. Example from the dialect dictionary with explanation of how it is structured.

The main components contained in the database are therefore:

- Lemma (= concept)
- Lemma comment
- Source list
- Keyword (= dialect entry in normalized spelling)
- Dialect form (= phonetic spelling of dialect form)
- Kloeke code and associated place name

At the start of the webportal project we set up a list of requirements which the portals should fulfill. The webportals should contain:

- Information about the digitization process of the paper books into a database
- A map of the Limburgian and Brabantic areas or dialects (see Fig. 1 and 2)
- Full overview of the volumes
- Access to the PDF versions of all volumes
- Overviews of all lemmas, keywords, places
- Search options at the level of lemma, keyword, place, allowing
  o Wildcards in the search terms
  o Filter options for place, Kloeke code, volume
- Hyperlinks between retrieved lemmas and corresponding keywords
- Access to the PDF files of the books via the results of the query.

3. Implementation of the Webportal

The e-WLD and e-WBD webportals are written in Python 3.5, building on the freely available Django web application framework. Django is a Python-based framework that makes it easier to build web applications quickly and with less code. The code of the portal has been developed using the PTVS facilities of Microsoft Visual Studio 2013. The site is served as an uwsgi application that runs under Apache on one of the webservers at Radboud University Nijmegen. All entries (close to 2 million dialect words) are stored in a Sqlite database.

The map on the site’s homepage, is based on the most recently available geographical data, and it shows the Belgian and Dutch dialect areas that are covered by the WLD.

The webportal allows listing the available dialect forms based on their lemma (begrippen in Figure 5), or on their keyword (trefwoorden in Figure 4). It is also possible to obtain a list of the locations (plaatsen in Figure 5) or (for WLD) a list of the coal mines where dialect forms have been collected.

Two of the search functions allow making use of additional filtering. The search for a lemma can be extended by filtering for: Kloeke code (a location code for the Netherlands and Belgium; see above), name of the location, dialect form, publication volume and, when applicable and only for WLD, the name of the mine where words have been elicited. Searching for a keyword adds a filter for the lemma and one for keyword comments. Search results can be downloaded as tab-separated text, as an Excel file or as an HTML file.

Figure 5 illustrates one type of search result. Looking for the keyword ‘inktappel’ yields two lemmas that contain this keyword: dennentakje met een harsknopje ’little pine branch that has a resin bud’ and galnoot ’gall apple’. Each of these lemma results is accompanied by a list of dialect forms, and each dialect form contains a list of locations (and possibly mines) where this form has been collected.

Figure 6 illustrates one type of search result. Looking for the keyword 'inktappel' yields two lemmas that contain this keyword: 'dennentakje met een harsknopje' ('little pine branch that has a resin bud') and 'galnoot' ('gall apple'). Each of these lemma results is accompanied by a list of dialect forms, and each dialect form contains a list of locations (and possibly mines) where this form has been collected.


4 PTVS is the Python toolkit for Visual Studio. The sources of the webportal are available at https://github.com/ErwinKomen/RU-wld.

5 The development process required a number of attempts to import all the data, which is why a special asynchronously running admin component was added, allowing the import process to be monitored. Importing the data from just one of the published volumes requires one to two hours.
attested. The locations can be accompanied by location-specific comments. The list of results is finished by a list of volumes where these lemmas occur.6

Figure 6. Results obtained for the keyword ‘inktappel’

An interested researcher can, on the basis of the search results, access the PDF version of the original publication and check the text over there.

4. Data model

The data model that is being used to represent the information in the dialect dictionary is shown in Figure 7. The basic unit in the data model is the Entry. Each entry contains the information pertaining to a dialect word: the word itself (‘woord’ in the model), additional information to this particular word (‘toelichting’) and a number of links to other parts of the database:

- A link to the Lemma of which this word is part
- A link to one of the Dialect’s where words have been elicited
- A link to the keyword (Trefwoord) it belongs to
- An optional link to a number of mines (Mijn) this word has been found (only for WLD)
- A link to the published edition (Aflevering) where this particular combination of dialect-word/keyword/lemma can be found.
- Each edition links to one of the three parts (Deel) to which the editions belong.

The data model chosen has direct consequences for processing and using the database, since the distance between which any two elements in a relational database can be found determines the complexity of a search and, consequently, the speed of searching. All Entry elements of one Lemma are found fast enough, but retrieving and sorting the related keywords (Trefwoord) is more complex. The use of Django, however, takes care of optimalizations behind the scene, arriving at a workable database.

5. Conclusions and Future work

The e-WLD website was launched on December 17, 2017 (Van der Sijs 2017) and was positively reviewed in local and national Dutch news papers. The same holds for the e-WBD website, which was launched on 14 December 2017.

For the first time we can count how much material the dictionaries actually contain: in the e-WBD there appear to be 15,794 concepts, 140,091 keywords and 1,704,116 dialect forms, collected in more than 1000 dialects (each place/location representing its own dialect). In the e-WLD there appear to be 17,539 concepts, 137,231 keywords and 1,759,090 dialect forms, collected in more than 1000 dialects (each place/location representing its own dialect).

Answers on many questions can now for the first time be given, for instance whether a specific word for a certain concept is really unique or not and where particular word forms can be found in the area. Another relevant research question is the relationship between word form distributions and semantic concepts. Word lists per location can be made now quite easily, which is highly supportive for writers of local dialect dictionaries. People can easily check whether a specific word form with a specific meaning was previously documented for a Limburgian or Brabantian dialect, or perhaps in another Limburgian or Brabantian dialect. Both webportals seem to meet both professional and popular needs of people interested in dialects.

Several collaborations have been set up in order to make sure that the same uniform data base model is used among various projects dealing with these dictionaries, including the Dictionary of the Flemish dialects (Woordenboek van de Vlaamse Dialecten, WVD).

The University of Ghent now hosts the overarching project ‘Dictionary of the Southern Dutch dialects. An integrated lexicological infrastructure for the Southern Dutch dialects’ (DSDD). Aim of this project is to integrate and standardize all three southern comprehensive dialect lexicographic databases (Limburgian, Brabantian, Flemish). The consortium involved includes linguists, ICT support staff, digital humanities experts and geographers. This project will be carried out in close co-operation with the INT, the Institute for the Dutch Language in Leyden.

Finally, the overarching data model is designed in such a way that not only other regional onomasiological dictionaries can be added, but also local semasiological dictionaries, i.e. dictionaries that contain a description of the dialect vocabulary of a specific place or small region. For the Netherlands, these dictionaries are collected, digitized and curated at the Meertens Institute, and made available through http://www.meertens.knaw.nl/ewnd/. The Flanders counterpart can be found at https://www.woordenbank.be.

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6 The abbreviated publication denotation consists of the part number (running from I to III) followed by the volume number. Part III deviates from this scheme, having each publication denotation consisting of: part number (that is: III), division number (ranging from 1-4) and then the volume number.
Figure 7. The data model used for the webportals of the dialect dictionaries

6. Acknowledgements

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7. Bibliographical References


WBD = Woordenboek van de Brabantse Dialecten.

WLD = Woordenboek van de Limburgse Dialecten (WLD).

WVD = Woordenboek van de Vlaamse Dialecten, Tongeren, 1979.