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. 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

1 A complete overview of all volumes can be found at http://www.e-wld.nl/delen and http://e-wbd.nl/delen
spoken: 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, German had the greatest influence because many workers came from Aachen and the surrounding area, while French borrowings were frequently occurring in Flemish mines due to the Walloon workers and staff.

The resulting database made it possible to uniform all data and to check information consistency. For instance, there were quite a number of inaccuracies in the so-called Kloke codes, either in the printed volumes or because of the OCR process. These Kloke codes, named after the dialectologist G. Kloke who constructed the system (Kruijssen & Van der Sij, 2010), refer to locations in the Netherlands and Belgium in a unique way.

The special phonetic symbols turned out to be the hardest problem, particularly for the Limburgian dialects. The editors decided that extremely fine-grained phonetic distinctions between the Limburgian dialects had, for scientific reasons, to be expressed, see Figure 3. Instead of using the IPA for this purpose, they developed an exclusive phonetic script containing many diacritics. The OCR programme could not make head or tail of it, so the resulting text was gibberish. Once the text was converted into a database and all phonetic symbols were put into a single field or column, systematic semi-automatic correction became feasible. This laborious task was done by retired editor Joep Kruijssen. The editors of the Brabantian dialects chose a less elaborate phonetic transcription. This too hampered computer reading, but in a less interfering way.

Along these lines we managed to greatly improve the process of data curation.

1.8.9 VARKENS FOKKEN
(N 76, 37b, monogr.)
|Zich toeleggen op de taal van varkens.|
|fokken: foko L 266, 267, 288a, 295, 318d, 328, 371, 375, 0426, Q 16, 27, 32, 112, 117; foko L 320a; kweken: kweko L 381, 423, Q 9; kweko L 414; kweko P 219, 219a; baggen kweken: bago kweko L 415, Q 11; telen: geolo L 318d; vermeerderen: varmiardar L 295; varkens optrekken: verko optrekko L 265; trekken: treko Q 197; tuchten: tussko Q 117; tussko Q 121; varken houden: verko hogo Q 1; verko hâ P 188.

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Figure 3. An example of the phonetic symbols used in WLD

All resulting LMF-files were stored in open access at the Meertens Institute in Amsterdam (which is a CLARIN Data Centre).

The next step was to design and implement a webportal. The idea was that a complete, curated database with a transparent webinterface providing precise and powerful selection and search tools would open up new avenues for dialect research in the Brabant and Limburg areas, in particular because the data are there for everyone on the internet. In the following sections we describe how we dealt with the design and implementation of the

2. Set-up of the Webportal

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

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)
- Kloek 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, Kloek 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.\(^3\) 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.\(^4\) 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.\(^5\)

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 4), 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.

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.
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 Brabantic dialect, or perhaps in another Limburgian or Brabantic 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, Brabantic, 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.
6. Acknowledgements

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7. Bibliographical References
