

# ENGLISH-LATVIAN DICTIONARIES IN THE AGE OF ELECTRONIC LEXICOGRAPHY

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**Abstract.** In the 21st century the advantages of electronic dictionaries have been widely acknowledged. Electronic dictionaries form an important branch of contemporary lexicography, however, in general English-Latvian lexicography print dictionaries still outnumber the electronic ones since there is only one large English-Latvian dictionary with complex microstructure and two differing user interfaces that is available in the electronic medium. The aim of the study is to analyse the major general English-Latvian electronic dictionary, determine its type and assess the compliance of this dictionary with the standards of contemporary electronic lexicography. The analysis focuses on the evaluation of dictionary microstructure, the accessibility of information, the adaptability of user interface, the use of dictionary-internal and external links and the sources of lexicographical data in the general English-Latvian electronic dictionary. The analysis reveals that even though the microstructure of the electronic dictionary is essentially based on a print dictionary, it has been supplemented by information from various other sources. The dictionary applies some innovative features of contemporary electronic lexicography, but various improvements related to the presentation of some metalinguistic elements, unity of microstructure, diversity of search options, use of dictionary-internal and external links, application of corpus data and multimodality would be necessary to enhance its correspondence to the standards of contemporary electronic lexicography.

**Key words:** electronic lexicography, English-Latvian electronic dictionary, headword, microstructure, user interface, corpus data

## INTRODUCTION

Electronic dictionaries form an important and fast-developing branch of contemporary bilingual lexicography and serve as an important tool for international communication. The changes introduced into lexicography by the introduction of electronic medium have been widely discussed and positively evaluated in the metalexigraphic literature, for instance, Fuertes-Olivera (2015: 324) asserts that it is 'crystal clear that many scholars see the future of lexicography in connection with the electronic medium, mostly the internet'. Granger (2012: 2) holds that 'today lexicography is largely synonymous with electronic lexicography' and adds that currently lexicography is 'at a turning point in its history' (*ibid.*: 10). These changes in the field of lexicography have even been compared to the transition from the manuscript culture to the invention

of printing (Gouws et al., 2013: 10). Thus, a topical question posed by many scholars is – when will electronic dictionaries oust the printed ones? Though it has often been predicted that the printed dictionaries will soon disappear from the face of the earth, it has not yet occurred, but it is quite likely that one day it might happen. However, most likely, at different times in various lexicographic traditions.

It is undeniable that nowadays dictionaries have ‘found their ideal platform in the online medium’ (Rundell, 2012: 15), but it is also important to note that this medium has to be used appropriately and wisely. There is still ample scope for improvement in electronic lexicography since, according to Granger (2012: 11), there is so much information available on the web for users to choose from that the compilers of the electronic dictionaries have to pay serious attention to user needs to persuade them to choose their products.

A glimpse at the scene of general English-Latvian lexicography in this age of electronic lexicography reveals that print dictionaries still considerably outnumber electronic ones. There are two medium-sized print English-Latvian dictionaries: a dictionary originally published by *Jāņa sēta* in 1995 (Belzēja et al., 1995), revised and updated in 2004 (Belzēja et al., 2004) comprising approximately 42 000 headwords, and another dictionary published by *Avots* in 2007 (Kalniņa et al., 2007) that claims to comprise nearly 85 000 headwords. There are also more than ten smaller, often derivative dictionaries, mostly produced by the publishing house *Avots*, nearly all of them published before the year 2010. However, there is only one major general English-Latvian dictionary with complex microstructure available in the electronic medium that can be accessed through two differing user interfaces. There are also several translation devices and smaller (often crowd-sourced) electronic dictionaries that reveal lack of careful editing of the information suggested by the users.

Thus, the aim of this study is to analyse the major general English-Latvian electronic dictionary, determine its type and assess the compliance of this dictionary with the standards of contemporary electronic lexicography.

## TYPES OF ELECTRONIC DICTIONARIES

According to the intended application, electronic dictionaries can be roughly divided in two major categories – dictionaries intended for human use and dictionaries designed to be used by computers. Only the electronic dictionaries for human use will be discussed in this study.

Based on their origin, electronic dictionaries can also be divided in two types – dictionaries transferred from existent print dictionaries or digitized print dictionaries and dictionaries compiled for the electronic medium or purpose-built electronic dictionaries (Svensén, 2009: 438–439). The properties of a print dictionary that has been adapted to the electronic medium have been described by Debus-Gregor and Heid (2013: 1002) as ‘somewhat “in between” those of

a paper dictionary and those of a dictionary conceived to exist exclusively as an electronic tool'. Though, it should be noted that these electronic dictionaries may be very close or nearly identical to the original print dictionaries or, due to extensive use of advantages offered by the electronic medium, already differ from them considerably. Tarp (2011) has proposed a typology of electronic dictionaries according to their degree of adaptation to the electronic medium and interest in the users' needs, dividing them in four wittily named categories: Copycats (copies or near copies of existent paper dictionaries), Faster Horses (print-based dictionaries that have been equipped with some advantages offered by the electronic medium), Model T Fords (purpose-built electronic dictionaries that make extensive use of information technologies in order to cater for the needs of the users) and Rolls-Royces (largely hypothetical purpose-built electronic dictionaries that would attempt to meet the needs of individual users). The latter ones, being purpose-built electronic dictionaries, quoting Granger (2012: 2), can be described as 'testimony that the innovations afforded by the electronic medium can radically transform every facet of dictionary design and use'.

Another subtype of electronic dictionaries comprises products where dictionary is combined with raw data from corpus. Asmussen (2013: 1082–1083) mentions several examples of such combined dictionary-corpus products, but also notes that the degree of integration of the material from both sources may vary. For instance, the electronic versions of the monolingual English learners' dictionaries *Longman Dictionary of Contemporary English* and *Oxford Advanced Learner's Dictionary* provide additional authentic examples made available through the user interface to give additional information about usage peculiarities of words and phrases. Willis et al. (2018) describe another ambitious project where entries of a historical dictionary of Old Norse prose were supplemented with manuscript texts from a historical corpus. While in some other dictionary-corpus combining projects the link between the dictionary and corpus is not so close or, according to Asmussen, 'they are not formally interlinked, they just appear side by side, accessible through a joint interface' (2013: 1083). A lexical resource (described by Trap-Jensen in 2010) combining two Danish online dictionaries and a corpus, and presenting some look-up possibilities across the three resources, serves as an example of partial dictionary-corpus data integration.

Furthermore, Asmussen (2013: 1084–1085) asserts that none of the above approaches presents a real combined dictionary-corpus product, which should offer separate access to dictionary and corpus, but at the same time they should be syntactically and semantically interlinked. It is also stressed that the access interface of the product should be user-friendly and adapted to the needs and skills of a non-expert user. Moreover, an important decision has to be made concerning the presentation of corpus evidence – as raw data (which would be appropriate as a source of authentic data for more informed and experienced users, but can contain mistakes) or as edited material (more appropriate for language learners and less experienced users).

It is evident that nowadays a purpose-built electronic dictionary is viewed as the most recommendable type of electronic dictionary, however, it is worth noting that the mere fact that a dictionary has been initially designed as an electronic tool, does not always guarantee its quality and superiority over electronic dictionaries originating from print dictionaries.

## AN OVERVIEW OF INNOVATIONS INTRODUCED TO LEXICOGRAPHY BY THE ELECTRONIC MEDIUM

The electronic medium has introduced some considerable changes in the structural system of the dictionaries. Since the information in electronic dictionaries is not stored sequentially and the alphabet is not necessary in the look-up process, the macrostructure has lost its vital importance while the microstructure has not lost its importance, but has become a less distinct notion due to the adjustable user interface (Svensén, 2009: 441). These changes have created a situation when users of electronic dictionaries at least to some extent can adjust the macro- and microstructure of the dictionaries according to their needs (Schmitz, 2013: 1015).

In the 21st century, the advantages the electronic medium can offer to lexicography have been widely acknowledged. The following is a brief summary of relevant innovations introduced to lexicography by the electronic medium that have been pointed out by Atkins ([1996] 2002: 11–16); Varantola (2002: 34–38); Atkins and Rundell (2008: 238–246); Svensén (2009: 439–447); Granger (2012: 2–5); Asmussen (2013: 1088–1089); Debus-Gregor and Heid (2013: 1005–1011), Engelberg and Müller-Spitzer (2013: 1023–1033):

- The considerably reduced space restrictions in the electronic medium allow the compilers to avoid using textual condensation, representation symbols and nested entries but provide a wider scope of data (e.g. additional examples, collocations, multimedia content). The only real space restriction is related to the screen space of user interface – it should not be overloaded with information because it is not convenient for users, moreover, for less experienced users who can lose interest or even get lost if the microstructure (or the user interface) of the dictionary is too overcrowded with information. Thus, often some information is presented in reduced form and, if necessary, can be expanded using clickable hyperlinks.
- The accessibility of information has considerably improved in electronic dictionaries – it has become easier to find information since users do not have to browse through the alphabetically arranged headword list. Besides, such search options as wildcard search (where such symbols as \* and ? can be used for unknown characters), incremental search (where the list of possible options is reduced with every character that is added) or fuzzy search (where existent words are suggested if something

non-existent has been typed in) can be offered to users in the electronic medium.

- The use of links or hyperlinks, both dictionary-internal (leading to another place in the same dictionary) and external (leading to sources outside the concrete dictionary) has made the text of the electronic dictionaries dynamic and the navigation through the dictionary and the related sources much quicker and easier.
- The interface of electronic dictionaries is adjustable and can be easily adapted (or even adapt automatically) to the users' needs and skills. Using the provided hyperlinks, users can expand or minimize the microstructural elements which are viewed as unnecessary. Thus, the electronic medium has transformed dictionaries from static to dynamic tools.
- Different types of reference works and language resources can be combined in an online electronic dictionary or at least some information from these sources can be made available to the user. For example, an electronic dictionary may be supplemented with data from monolingual and parallel corpora, lexical databases, specialized dictionaries and encyclopaedias, thus, creating a multipurpose tool. Such collections of electronic dictionaries and other language resources (also referred to as dictionary portals) may be cross-referenced to various degrees.
- The use of electronic medium has facilitated extensive and efficient use and presentation of corpus data in the process of compiling the main body of dictionary entries as well as providing additional examples, collocations and other microstructural elements.
- The electronic medium has also ensured the multimodality of dictionaries – if in print dictionaries the textual modality could be supplemented only with pictorial illustrations, electronic dictionaries can also provide sound recordings and videos.
- Users can contribute to compiling and improving of electronic dictionaries by sending comments and suggestions related to the lexicographic information provided in the dictionary and language change or pointing out mistakes. This process, often referred to as *collaborative lexicography*, has become very popular, though, it is important to note that quality control is a very important part of this process.

These are some of the most obvious and widely recognized innovations brought into lexicography through the application of electronic medium, though, certainly, this is not a finite list. These advantages not only allow the dictionaries to comprise more information but have also made the information more easily accessible and the dictionaries more user-friendly. Some scholars even refer to such properties of electronic dictionaries as *added value* (e.g. Atkins and Rundell, 2008: 241; Debus-Gregor and Heid, 2013). A hard fact of life, though, is that these innovations are not always introduced when compiling electronic dictionaries.

Having stated that the contemporary electronic dictionaries are capable of fulfilling various past and present lexicographers' dreams, Schmitz (2013: 1021–1022) also notes that the lexicographic community is at the beginning of a new era, but the opportunities it offers are very demanding both theoretically and practically. Thus, he mentions some desiderata for more successful exploitation of electronic medium in lexicography, for example, more varied computational linguistic tools could be linked to electronic dictionaries, more attention should be paid to designing and testing of better and more user-friendly interfaces, more profound and systematic research of the use of electronic dictionaries should be carried out, exchange of experience and collaboration on the international level should be considerably enhanced.

## METHODOLOGY

In order to provide an insight in the general English-Latvian electronic lexicography in the 21<sup>st</sup> century, the aim of this study is to analyse the largest and most complex general English-Latvian electronic dictionary, determine its type and assess its compliance with the standards of contemporary electronic lexicography.

The advantages and innovations introduced to lexicography by the electronic medium will be applied as the main criteria of analysis of the major general English-Latvian electronic dictionary (ELED). First some microstructural peculiarities of the dictionary will be pointed out, then the dictionary will be described and evaluated using the above criteria, eventually the type of the electronic dictionary and its compliance with the standards of contemporary electronic lexicography will be determined. Thus, the analysis is based on the following criteria:

- the structure- and content-related aspects of dictionary microstructure;
- the accessibility of information;
- the adaptability of dictionary interface to the users' needs;
- the use of dictionary-internal and external links;
- the combination of various reference works and language resources;
- the use of corpus data in compiling and updating of the dictionary;
- the possibility of user contribution;
- the multimodality of dictionary.

It should be noted that these criteria of analysis will not always be dealt with in the above order since some of them, being tightly related and even partly overlapping, cannot be treated in isolation.

The English-Latvian electronic dictionary (ELED) analysed in this study is based on the 1995 edition of the English-Latvian print dictionary published by *Jāņa sēta*, which has been supplemented with terms from various terminological dictionaries, abbreviations and nearly 150 000 monolingual entries from

the lexical database *WordNet 2.1* (an older version of the currently available *WordNet 3.1* (Online 1)) at *Tilde*, a leading language technology company in Latvia. Since the ELED was updated and supplemented with new entries in 2009, now it can already be viewed as quite outdated. Thus, currently the dictionary is being updated using data from the reversal of *Tilde's* Latvian-English electronic dictionary (LEED) (Online 2) compiled by Andrejs Veisbergs. The ELED can be accessed using two similar but somewhat differing user interfaces (both developed by *Tilde*), hereinafter, referred to as English-Latvian electronic dictionary *Letonika* (ELED-L) (Online 3) and English-Latvian electronic dictionary *Tilde* (ELED-T) (Online 4, which is available only to the subscribers of the software product *Tildes Birojs*). However, the distinction between the interfaces will be made only when describing the aspects of the dictionary microstructure where the interfaces vary, otherwise the generalized abbreviation ELED will be applied to refer to this dictionary. As regards the availability of the dictionary – a reduced version of the ELED-L is available free of charge, but the access to full content of the dictionary through both its interfaces is offered only to subscribers.

There are several more translation devices and smaller electronic dictionaries including crowd-sourced or collaborative dictionaries. They often present a limited scope of information on the microstructural level and may reveal lack of monitoring and editing of the information suggested by users. Some samples of English-Latvian dictionaries (all of them include the word *dictionary* in the title) available online are presented here, applying the previously established abbreviation ELED supplemented by the website where they have been made available: ELED-Glosbe (Online 5) is an online translation device rather than a bilingual dictionary; ELED-Ectaco (Online 6) is a combination of a translation device and a dictionary with quite limited microstructure; ELED-Lingea (Online 7) is a fairly small dictionary which is presented only as a Latvian-English dictionary, though it also comprises an English-Latvian direction). These dictionaries will not be discussed in the present study since due to very limited structural complexity and editorial work they do not provide useful material for the discussion of the state of the art of general English-Latvian electronic lexicography in the 21<sup>st</sup> century, though, possibly, the situation might change if the content and editorial work of these dictionaries are enhanced.

## ANALYSIS OF ENGLISH-LATVIAN ELECTRONIC DICTIONARY: FINDINGS AND DISCUSSION

Since the general English-Latvian electronic dictionary analysed in the present study can be accessed using two user interfaces, which may vary according to the layout and information categories presented, they will be discussed alternately, commenting on the different solutions when necessary. Screenshots of both interfaces will be provided to illustrate the discussion of various microstructural aspects of the dictionary.

The presentation of the entry *regulation* retrieved from both interfaces of the ELED is provided in Figure 1 (ELED-L) and Figure 2 (ELED-T).

The screenshot shows the ELED-L interface. At the top, there is a navigation bar with options: Enciklopēdijas, Vārdnīcas, Lasītava, Multivide, Valoda, Ceļvedis, Pasakas, Kultūras kanons. Below this, the search bar contains 'regulation' and the results are shown for 'Angļu—latviešu vārdnīca'. A list of related terms is visible on the left, including 'regulation', 'regulation account', 'regulation of the impression...', 'regulation time', 'regulations', 'regulations duty', 'regulations for use', 'regulations of a collective farm', 'regulations of an enterprise', 'regulations of an establishment', 'regulative', 'regulator', 'regulator gene', 'regulatory', and 'regulatory agency'. The main entry for 'regulation' is displayed, including its phonetic transcription [ˈregjuˈleɪʃn] and its classification as a noun. The entry lists three meanings: 1. regulēšana, 2. priekšraksts; regula; noteikums (with a sub-entry for traffic regulations), and 3. plural nolikums. The source information at the bottom reads: © Zīrīda Belzēja, Irēna Birzvalka, Lūcija Jurka. Rasma Mozere, Jānis Raškevičs, Agris Treilons, 1995; © Tilde, 2009. There are also sections for 'TERMINI' and 'SKAIDROJUMI'.

Figure 1 Entry *regulation* retrieved from ELED-L (Online 3)

The screenshot shows the ELED-T interface. At the top, there is a navigation bar with options: Translation, Synonyms, Encyclopedias, Grammar, OCR, Speech, Templates, Library. Below this, the search bar contains 'regulation' and the results are shown for 'English' to 'Latvian'. The main entry for 'regulation' is displayed, including its phonetic transcription [ˈregjuˈleɪʃn] and its classification as a noun. The entry lists three meanings: 1. regulēšana, 2. priekšraksts; regula; noteikums (with a sub-entry for traffic regulations), and 3. plural nolikums. The source information at the bottom reads: Enhance your dictionary or suggest a translation. There are also sections for 'TERM DICTIONARIES', 'EUROTERMBANK DICTIONARIES', and 'USAGE EXAMPLES'. A list of related terms is visible on the right, including 'regulation', 'regulations', 'traffic regulation', 'temperature regulation', 'regulation', 'state regulation', 'self-regulation', 'regulation account', 'loan regulation', 'ink regulation', and 'indirect regulation'.

Figure 2 Entry *regulation* retrieved from ELED-T (Online 4)



The content of the *general part* or the main body of this entry is nearly identical in both cases – it reveals that the selected headword *regulation* is a noun, its pronunciation is presented using the symbols of the International Phonetic Alphabet (recorded pronunciation is available only for the users of ELED-T), the word has three senses, one collocation is also provided. The content of this section of the microstructure is often very similar or even identical with the content of the original print dictionary (a reference to it is provided below the main body of the entry in ELED-L and under the symbol © in ELED-T interface).

Both interfaces on the left or right-hand side of the screen present additional lists of hyperlinked headwords, though the selection criteria and layouts of these lists differ. Figure 1 shows that ELED-L comprises a list of alphabetically arranged headwords that follow the selected item, however, it should be noted that this list includes not only headwords of the ELED but also provides cross references to other sources linked to the dictionary. Figure 2 reveals that in ELED-T the list is not alphabetical and comprises derivatives, compounds, collocations and phrases featuring the selected headword, furthermore, these items may appear in the dictionary as the main and secondary headwords as well as examples. These additional lists serve as dictionary-internal cross-references, but in ELED-L also as dictionary-external links. They are not of vital importance for the look-up process in an electronic dictionary but could be beneficial for users in several ways. The alphabetical list provided in ELED-L resembles the traditional alphabetical list of headwords found in print dictionaries and might help in the look-up process if the user has doubts about the correct spelling of the headword or enhance the possibility of serendipity (a more typical advantage of print dictionaries), it could also meet the needs of the users who still prefer the look-up process offered by print dictionaries. The list offered in ELED-T could increase the awareness of items related to the selected headword and help to navigate through the dictionary. None of these lists can be minimized, but the one found in ELED-L can be expanded to view the full list of headwords resembling the macrostructure of a print dictionary.

The systems of presentation of various types of labels and secondary headwords in both interfaces are also dissimilar. In ELED-T (see Figure 2) the part of speech labels and other grammar-related labels (e.g. *noun*, *plural*) are presented in full form, while the other groups of labels (e.g. subject field, regional, formality), placeholders (e.g. *smb.*) and metalinguistic comments (e.g. *u. tml.*) have been abbreviated, the plural form of the headword is replaced by a swung dash in secondary headwords and examples (e.g. *traffic ~s*). In ELED-L (see Figure 1), on the other hand, all types of labels, placeholders and metalinguistic comments are presented in abbreviated form, while the headword in secondary headwords and examples is presented in full form. Thus, it can be concluded that in both cases the approach to presentation of lexicographic metalanguage and secondary headwords only partly corresponds to the system typically applied in contemporary electronic dictionaries. They usually present these microstructural

elements in full form, as there are no space restrictions in the electronic medium but is willingness to make the dictionary text more transparent and comprehensible for users.

As regards the search options, incremental search is available in both user interfaces, though in ELED-L no distinction is made between English and Latvian options, thus, the possible list of headwords suggested, while the word is typed in, may contain both English and Latvian headwords. The dictionary comprises nested entries, especially the entries of highly polysemous headwords may contain long lists of nested items (e.g. collocations, phrasal verbs, phrases). Some of the items that are presented in nested entries may also appear as separate entries (e.g. the phrasal verbs *look up*, *give in*, *go out*). The possibility to de-nest items from highly nested entries is a very useful feature offered by the electronic medium since it considerably enhances and speeds up the look-up process. The search for nested items in this dictionary is typically directed to the entry where they are listed, though, if the phrase has not been typed in precisely as presented in the entry, in ELED-L the search may lead to the explanatory rather than the bilingual part of the entry, while in ELED-T to machine translation rather than the dictionary. Thus, it can be inferred that several of the technical advantages offered by the electronic medium have been used to ensure the accessibility of information in this dictionary, but it could be further enhanced by diversifying and improving the search options.

The screen space of both user interfaces is not overcrowded with information and each interface offers several similar expandable sections that lead to additional parts of the dictionary microstructure, thus, revealing the adaptability of the user interface to the needs and interests of different users. ELED-L offers its registered users to view the full entry using the link *Skatīt pilnu šķirkli* (See the full entry), then two expandable sections are provided (see Figure 1) – *Termini* (Terms) presenting translated terms from various bilingual terminological dictionaries as well as terminology bank *EuroTermBank*, and *Skaidrojumi* (Explanations) presenting definitions for various senses of the headword and illustrative examples from *WordNet 2.1*. ELED-T also offers three expandable sections (see Figure 2) – the first *Term Dictionaries* presents similar content as the one provided in ELED-L with the addition of translated phrases and sentences from several other sources (e.g. *Eurovoc Thesaurus*), the second section presents translated terms from *EuroTermBank*, but the third *Usage Examples* presents automatically selected translated examples from the parallel English-Latvian corpora used for compiling of bilingual dictionaries (see Deksne and Veisbergs (2018: 129–131) for description of the parallel corpora and their application in updating of the LEED) and developing machine translation tools at the company *Tilde* (see Figure 3). This is a relevant addition to dictionary entries since it comprises authentic corpus data showing the actual use of the headwords. It could be further improved by providing translated examples illustrating a wider scope of senses of polysemous words (usually these are only the most widespread

senses), moreover, due to the fact that these are automatically selected examples, one can come across occasional mistakes and mistranslations, which might mislead some less advanced and experienced users.

#### USAGE EXAMPLES ▲

- The implementing regulation may permit other exceptions.
- Īstenošanas regulā var būt paredzēti citi izņēmumi.
- Details of the register should be established by a Commission implementing regulation.
- Komisijas īstenošanas regulā būtu jānosaka sīkāka informācija par reģistru.
- Before adopting any regulation.
- Pirms visu regulu pieņemšanas.
- A reference to the regulation applicable,
- Atsauce uz piemērojamo regulu,

Figure 3 Fragment of the expanded section *Usage examples of the entry regulation* from ELED-T (Online 4)

#### TERMINI

LV **noregulēšana** ekon.  
 RU **урегулирование**,  
 EN **regulation**,  
 DE **Regulierung**

© Autoru kolektīvs Valentīnas Skujiņas vadībā: Hermanis Kadiķis, Ruta Grēviņa, Inese Vaidere, Jānis Kalniņš, Regīna Kvašīte, Latvijas Zinātņu akadēmijas Latviešu valodas institūts, 1997; © Tilde, 2009

EN **regulation** *mut*

1.  
 LV **kārtošana**,  
 LV **regulēšana**

2.  
 LV **priekšraksts**,  
 LV **kārtība**

© Sast. Irēna Blumfelde, Irēna Matisone, Aija Ķēbere, Lauma Krieviņa, A. Valujevs; rec. Valentīna Skujiņa, Jāņa sēta, 1997; © Tilde, 2009

Figure 4 Samples of entries from terminological dictionaries compiled in Latvia from ELED-L (Online 3)

The Latvian equivalents provided in the ELED are presented as hyperlinks leading to the headwords of the LEED (and vice versa), thus establishing a tight network of dictionary-external links between the English-Latvian and Latvian-English dictionaries provided through both interfaces. In the terminology sections of the entries available through ELED-L the Latvian equivalents from the bilingual terminological dictionaries and databases compiled in Latvia have been presented as hyperlinks (see Figure 4), while the equivalents of the entries selected from the *EuroTermBank* (Online 8) and *Eurovoc Thesaurus* (Online 9) have not been hyperlinked (see Figure 5). In contrast, the equivalents from the *EuroTermBank* available through ELED-T have been hyperlinked. ELED-L, on the other hand, provides the only dictionary-external link leading to the terminological database *EuroTermBank* (the title has been hyperlinked), however, it should be added that the user is directed to the term bank in general, not the concrete term that has been searched for.

## eurotermbank

Eiropas daudzvalodu terminoloģijas portāls

sociālās lietas, cita ražošana

EN [regulation](#)

LV noteikums

Eiropas organizācijas, Eiropas kopienas

EN [regulation](#)

LV 1. regulējums

LV 2. noteikums

LV 3. nolikums

LV 4. priekšraksts

LV 5. regula

dabaszinātnes un eksaktās zinātnes, mašīnbūve

EN [regulation](#)

EN [adjustment](#)

EN [setting -up](#)

EN [setting](#)

LV regulēšana

Figure 5 Samples of material from *EuroTermBank* available from ELED-L (Online 3)

The analysis of the linking system established in the ELED reveals that both interfaces of the dictionary present a network of dictionary-internal links, which can considerably improve the navigation through the dictionary. It should also be noted that the compilation of data from various terminological dictionaries and databases (or the opportunity to search for information retrieved from several sources simultaneously) provides valuable information on the use of the headword and its various equivalents in different subject fields. However,

since information from each source has been presented separately, it also leads to somewhat fragmented microstructure and partial overlapping of information, which might cause some look-up problems to less experienced users.

Both interfaces of the ELED provide data from or links to various reference works and language resources. Some of them, for example, *EuroTermBank*, *WordNet*, *Eurovoc Thesaurus* and various bilingual specialized dictionaries have already been mentioned in the context of adaptability of dictionary interface and the system of links, however, apart from the above, both interfaces offer another set of links to various types of sources listed in the upper section of the screen (see Figure 1 and 2). Thus, ELED-T offers several links including 'Translation' leading to the dictionary as well as offering machine translation of the search word or phrase if it has not been found in the dictionary, the link *Synonyms* provides synonyms, definitions and untranslated examples from *WordNet*, the link *Encyclopedias* leads to *Wikipedia*, the link *Grammar* provides some basic information depending on the part of speech of the search word (e.g. plural form(s) for nouns, principal forms for verbs), the other links are not directly related to the dictionary in question. The opening screen of the digital information repository of the Latvian language *letonika.lv* (Online 10) apart from ELED-L, comprises two links related to reference works: *Vārdnīcas* (Dictionaries) offering a list of eleven bilingual dictionaries (e.g. Latvian-English, Latvian-Russian, Russian-Latvian) and a dictionary of personal names as well as *Enciklopēdijas* (Encyclopedias) presenting a list of eleven encyclopaedias and specialized dictionaries.

Even though not all of the abovementioned reference works and language resources might be useful for the target audience of the ELED in the process of consulting a bilingual dictionary, it is obvious that by providing a set of reference works and language resources, both user interfaces at least to some extent resemble portals of electronic dictionaries, thus, utilizing another advantage offered by the electronic medium.

Another important advantage offered by the electronic medium is the possibility to make extensive use of corpus data. Data from English-Latvian parallel corpora have been used in selection of translated examples available at ELED-T as well as when supplementing the main body of the dictionary with headwords and equivalents. This approach places the ELED in the category of corpus-informed dictionaries that has been described by Kosem (2016: 79) as revealing limited use of corpus data, for instance, 'for a specific dictionary feature, which is often one of the upgrades from the previous version of the dictionary'. Data from general representative corpora of the English language so far have not been applied while updating the ELED; though, evidently it would help in the process of enhancing of the dictionary, for instance, while extending the dictionary macrostructure.

Both interfaces of the ELED comprise a section inviting users to send their comments on the entry (ELED-L) and supplement their customized dictionary or propose their translations (ELED-T). Thus, the editors of the dictionary

encourage users to contribute to updating of the dictionary but also make it clear that the process of user involvement is carefully monitored.

The potential of multimodality offered by the electronic medium in compiling and improving of the ELED so far has been utilized to a limited extent. The dictionary does not comprise any pictorial illustrations or videos, it includes only sound recordings. These modes of information presentation can be used in electronic dictionaries not only to make them more lively and user friendly, but may also enhance the users' perception of some microstructural elements, for instance, the introduction of recorded pronunciation of the English headwords could be appreciated by those users who are not sufficiently familiar with the symbols of the International Phonetic Alphabet applied in this dictionary. This user-friendly feature has been made available for the users of ELED-T interface.

## CONCLUSIONS

The analysis reveals that even though the general English-Latvian electronic dictionary analysed in this study is based on a print dictionary (currently already quite outdated), it is not merely a digitized print dictionary since it has been updated and supplemented by information from various reference works and language resources. Despite the fact that this approach enriches the contents of the entry, it also leads to quite fragmented microstructure and occasional overlapping of information in the entry. Typologically the dictionary still belongs to the somewhat extended category of dictionaries transferred from existent print dictionaries, or *Faster Horses* according to Tarp's (2011) classification, but, thanks to the introduction of some innovative features, for instance, illustrative examples from parallel corpora and adaptable user interface, it has already started moving in the direction of more advanced electronic reference work.

The analysis of the dictionary, which is available through two varying interfaces, reveals implementation of various innovative features of contemporary electronic lexicography, but various improvements primarily related to the presentation of some metalinguistic elements and secondary headwords, unity of microstructure, diversity of search options, use of dictionary-internal and external links, application of corpus data and multimodality, would be necessary to enhance the correspondence of this dictionary to the standards of contemporary electronic lexicography. Moreover, it would be beneficial for the users if all the positive innovations were available through both interfaces which may vary both in content and the mode of presentation.

It is also worth noting that in the process of further development of the dictionary, the focus should be primarily on enhancement of the English-Latvian dictionary *per se* (which in many ways still resembles the print dictionary it is based on), only then on the other additional bi- and monolingual elements of its microstructure.

General English-Latvian lexicography has entered the age of electronic lexicography with a dictionary which to some extent already meets the standards of contemporary electronic lexicography but also has considerable potential for further development.

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## ELECTRONIC DICTIONARIES AND LEXICAL DATABASES

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