

Towards Computer-Assisted Latvian ICT Terminology Development

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Abstract

Currently, Information and Communication Technology (ICT) terms are mainly created in English, and the secondary-term formation is carried out in Latvian. Nevertheless, in our rapidly changing world, the number of ICT terms that need to be formed in Latvian exceeds the current capacity of ICT terminologists.

Thus, this paper aims to provide insight into the historical context of ICT term formation in Latvia in general, describe the current ICT secondary term-formation process in Latvia in particular, and explain the need for more productive secondary term-formation of ICT terms in Latvian.

The paper emphasises the need for further research on determining the parts of a secondary term-formation process that could and should be automated as soon as possible to increase the rate of secondary term-formation in Latvian.

Keywords

Information and Communication Technology terms, secondary term-formation, automation

1. Introduction

*What changes, endures
(c)Rainis*

The article deals with Information and Communication Technology (further in the text - ICT) terminology development in Latvia in general and with the process of secondary term-formation in the ICT field in particular.

The article consists of insight into the history of ICT terminology development in Latvia, provides a brief description of the current secondary-term formation process in Latvia, and introduces the current challenges and solutions.

The primary attention is focused on describing the decision-making process of the terminologists while looking for appropriate secondary-term in Latvian.

The topicality of the current research lies in several aspects.

First of all, in the relatively short run, next the few years, the current research could be helpful as terminology formation guidelines for ICT field professionals and translation companies that deal with ICT terminology, usually within a limited time frame (when it is necessary to decide within a few hours maximum what terminology unit you will create, in order to comply with deadlines) and human resources, when it is little or no time to choose official terminology creation process that usually takes at least several days.

Next aspect, the same principles that are discussed in at least partially automated ICT terminology creation might be transferred and of good use for other fields – economics, music, forest management and others, thus facilitating the terminology and language development in these fields.

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Last but not least, in the long run, if we speak for the next few decades, we would like to remind the significance of terminology in cross-culture and cross-industry communication. It is well-known that for academic communities and various industries, precise communication and understanding among different languages and cultures, exact usage of the terminology is of utmost importance in order to communicate concepts correctly and thus understand each other.

Although in the last few years, there has been made significant progress in the quality of machine translation (*GoogleTranslate*, *AmazonTranslate*, *Tilde*, *DeepL*), still one of the fundamental aspects of translation preciseness is the human work invested in the creation of terminology, which is used in the high-quality machine translation.

In conclusion, insight into possible ICT terminology development scenarios for Latvia and possibilities for future research is provided. The need to identify and automate as much as possible parts of secondary term-formation is emphasised.

2. Terminology unit, primary and secondary term formation

When we discuss term formation, it is essential to distinguish the concepts “term formation”, “primary term formation”, and “secondary term formation”.

Terminology unit or term, as I. Zauberga explains in her book “Theoretical Tools for Professional Translators”, is the word used for “describing a concept in a specific area” [1], Merriam-Webster dictionary [2] defines “term” as “a word or expression that has a precise meaning in some uses or is peculiar to a science, art, profession, or subject”.

Primary term formation, according to J. C. Sager’s “Practical Course in Terminology Processing”, accompanies “concept formation and is therefore monolingual” [3]. The further described process will reflect forming a terminology unit in the source language.

In the context of this article, to understand secondary term formation better, let us take a look at the term “computer” in the source language (English). It will be a term with the following definition “an electronic machine that is used for storing, organizing, and finding words, numbers, and pictures, for doing calculations, and for controlling other machines” [4].

According to J. C. Sager, *secondary term formation* “occurs when a new term is created for a known concept [...] as a result of knowledge transfer to another linguistic community” [3]. Thus when in Latvian term “dators” is created with a definition “Tehniska sistēma (ierīču komplekts), kas saskaņā ar uzdotu programmu veic automātisku datu apstrādi un ievadizvadi.” [5]), then the secondary term formation in the target language (Latvian) takes place.

3. Secondary term formation in the ICT field and usage of CAT tools

To speak about a specific matter, we need to agree on the meaning of the words or, in specific usage, terms.

It is possible to describe an object or a process in a straightforward way, but it takes much time and effort. Thus term and terminology is a way to agree on how we will name things in a specific field.

There is extensive research and information on *neology*, or, to be more specific, on *term creation* or *primary* term creation available [3], [6], [1] and there is available research, theoretical and methodological considerations on *secondary* term creation in Greek [7], Greek and German [8] and other languages.

Nevertheless, there can be found relatively little research on *ICT* secondary term formation - in Romanian [9] and Sinhala language [10]; *ICT* term formation is also discussed in research about term creation in Northern Sotho [11].

There is related research in translation automation and the use of ITC and CAT tools [12] - various computer-assisted translation tools - TRADOS, Memsources and others that enable the transformation of translation activity from translating manually to the next technocratic level.

Namely, if we draw parallels with the history of the translation process and its automation, then now we have evolved (at least for technical texts, manuals and legal texts) from “monk-scribe”, as Umberto Eco once upon a time called medieval writers and translators, to translators who translated

writing by hand and typewriter, then moved to various incarnations of word documents where already it was an achievement that written text could be changed with “find and replace” (for example, person name, place name, spelling). Then there was the development of the translation programs where text segments could be translated (taken from the translation memory), and the translator’s work was made easier – the translator had to evaluate the offered translation of the segment and either choose and confirm the offered version or decline and enter translator’s version.

Even if the partially automated machine translation (MT) process is not perfect, still it speeds up the translation process significantly. We have arrived at the moment when human involvement in the translation process (as long as we speak about technical texts with a large percentage of repetitive texts, not belles-lettres, poetry and other types of creative texts) consists mainly of post-editing.

Various aspects, namely editing on macro-level and micro-level translation process as well as guidelines and evaluation for the post-editing, were already described eight years ago [13], and the current state of pre-editing and post-editing for machine translation is described in detail [14]. Currently, there is the European Association of Machine Translation and conferences dedicated to machine translation, and the most recent took place in the spring of 2022 [15].

Thus, we envision that what can be applied to the translation process in order to speed it up and make it more consistent can and should be applied to the terminology creation process in order to free up more human resources for the creative part of the term formation and reduce the manual, mechanical work of looking up references, texts, dictionaries.

4. The origins of ICT terminology in Latvia

Although a rapid development of terminology in Latvia started more than a hundred years ago, in the first decade of the 20th century [16], the ICT terminology developed in the 1960s with the beginning of the IT-based industry; namely, with the establishment of the Institute of Mathematics and Computer Science, the University of Latvia [17] and the Institute of Electronics and Computing [18].

Nevertheless, as the computing devices were accessible to a very limited number of people [19], the terminology was mainly used by a limited number of professionals as well mathematicians, students of the Faculty of Physics and Mathematics, researchers who worked in the field of computing; no systematic term formation work was carried out.

With the collapse of the Soviet Union and economic and political changes around 1992, personal computers and the Internet became accessible to the broader community for everyday people, and user-guided term-creation began. If there was a computer and a modem connected 9600 bytes per second, then the owner of the computer and modem had to be also a terminologist and somehow name the device and the action taken. Usually, naming resulted in creating calque, transliterating or transcribing the English ICT term and adding Latvian ending, for example: “mouse” – “pele”, “computer” – “kompjūters”, “file” – “fails”, “router” – “rūteris”, “save” – “seivot”, “start” – “startēt”, “connect” – “konektēties”.

The determinant moment in primary and secondary ICT term development came in 1993 when systematic terminology work started with the foundation of ITTEA (Informācijas tehnoloģijas, telekomunikācijas un elektronikas terminoloģijas apakškomisija), namely “Information and communication technologies sub-commission” of the Terminology Commission of the Academy of Science of Latvia. In the June of 2022, more than 9000 terms are currently approved.

The existing terminology-formation work, its typical challenges and solutions are analysed in [20].

4.1. Current situation in ICT term development

There is rapid development in the ICT field, especially since the Covid-19 and distance learning and working, as well as providing all kinds of services remotely.

Therefore, there is a need for ICT terms in Latvian; if we do not develop the terms, the users will form them, and we will return to the year 1992, with calques, transcriptions and borrowings as the prevailing method of term-formation.

Presently, terminology formation work is done by ITTEA sub-commission members, largely manually: looking up the definitions of the term, searching for existing translations in dictionaries, thesaurus, parallel texts, et cetera and combining them.

We will look at existing algorithms used by two ITTEA sub-commission members while searching for possible variants of rendering English ICT terms in Latvian.

ITTEA mainly deals with the following issues:

1. ISO 2382 (Information technology - Vocabulary, 3000+ terms);
2. ISO/IEC/IEEE 24765:2017(E) ISO Systems and software engineering vocabulary (more than 4500 terms);
3. Machine Learning and Computer Linguistics;
4. Internet of Things and Smart Technology from the European Union;
5. Current issues – answering questions regarding terminology formation we receive from the Latvian Language Agency, European Commission and other institutions.

4.2. Secondary term-formation methodology guidelines in general

Secondary term-formation methodology, in general, is as follows.

When forming terms, we try to maintain a systemic approach in the development of the Latvian ICT terminology, defined by Latvian terminologist Valentīna Skujiņa in her monography, “The Principles of Formation of Latvian Terminology” [21]:

1. Using already existing terms;
2. Using existing terms as a part of the new term – compounds, hyphenated compounds;
3. Coining completely new terms

When preparing terms for secondary term-formation, we:

1. Analyse terms in the context of a specific sub-domain;
2. Consult industry professionals;
3. Take into account the frequency of use of the term.

5. Secondary term-formation methodology in particular

Dr.math. Jānis Cīrulis [22], a member of ITTEA, narrates his terminology formation process as follows.

For an easier understanding of the terminology formation process, this narration is structured in the table, where the “user demand” is described in the title of the table and the actions taken are listed in the table contents.

J. Cīrulis says that in case the English ICT terminology unit is not known to him, and neither has he understood the meaning of the concept described (please, check Table 1), he begins by looking up monolingual, general dictionaries: Oxford English Dictionary (British English) and Merriam-Webster (American English). He also uses search engines, for example, OneLook Dictionary Search (it indexes more than 900 dictionary sites) and Google (Google Search), using the following request “<term>, the definition” to understand the general meaning or several meanings of the word (or part of the collocation).

Table 1

Searching for a general concept of terminology unit

Source type	Source title	Source URL
Dictionary	Oxford English Dictionary	https://www.oed.com/
Dictionary	Merriam-Webster	https://www.merriam-webster.com/
Search engine	OneLook Dictionary Search	https://onelook.com
Search engine	Google Search	https://www.google.com

Then, to comprehend the specific meaning and usage (please, check Table 2), he uses search engines (Google, Google Scholar), as well as Wikipedia, which is useful for quick reference and general insight into a new field.

Table 2

Searching for the specific concept of terminology unit.

Source type	Source title	Source URL
Search engine	Google	https://www.google.com/
Search engine	Google Scholar	https://scholar.google.com/
Online encyclopedia	Wikipedia	https://www.wikipedia.org/

When he has achieved the moment when it seems that the general meaning is understood, it is possible to start looking for a corresponding functional analogue in Latvian. Still, there is know-how: if the term is related to the ICT field, he waits for the opinion of more knowledgeable colleagues. However, this method is not applicable in terms of mathematics and logic.

Looking for functional analogues differs significantly for terms that he encounters for the first time and terms he is already familiar with. In the second case, he searches his memory, looking for existing solutions in the collateral branches: mathematics, physics, electronics and others. Is the term already translated into Latvian? If it is translated, then how exactly?

Next follows a few remarks on frequent challenges and possible solutions.

When we are dealing with word-group terms or collocations, even if the components of word-group are familiar, it is essential to understand the syntactic structure of the English term. A precise comprehension of the term (although definitions tend to be quite different) is facilitated by using a clear-cut definition of the term (if it can be found) and checking the usage of the word-group term in the actual context, namely searching for the term in parallel texts. When looking for the possible functional analogue of the term in target language (Latvia), it helps to find the possible solution by looking up and comparing existing secondary ICT terms in other synthetic languages (French, German and others), which use inflections to express syntactic relations in sentence. Examples of other languages are also helpful for creating a more appropriate term for its definition.

A recent example: “computation data use”. After thorough research of the term and its definition, it is possible to strongly insist that “computation” is not an adjective for “data”, but it is an adjective for the established word-group term “data use”; thus, it is not related to “computing data”, “actual data” or any other kind of “data”.

In conclusion, J. Cīrulis remarks he has benefited the most from Wikipedia (having found English–origin word for term creation in Latvian) when looking for appropriate terminology units in Latvian that would correspond to the concept of the term in English, even if it sometimes means giving up the Latvian origin for terminology unit (this attitude contradicts the opinion of part of the ITTEA commission that terminology should be mainly created from words of Latvian origin).

Agnese Apse-Apsīte, also ITTEA commission member, translator and terminologist in EC DGT.C.LV.2 (Latvian Language Unit) European Commission, describes the term formation as follows.

She states that DGT.C.LV.2 are guided by the principle that the creation of new terms is the last resort, and thus we must first try to find out if the term already exists.

According to her, ICT terms could be divided into two parts: industry-specific, “technical” terms (used by professionals in various fields - programmers, electronics manufacturers, security authorities, and other.) and popular-science terms widely used in society (such as in conversation, on the website, and other.).

They are working with both parts, as the Commission produces both very detailed technical specifications and press releases and teaching materials for primary schools.

When encountering ICT terms in the text, the terms searching and terminology formation processes usually are as follows.

Term *searching* process (please, check Table 3) used by DGT.C.LV.2:

1. first, search Interactive Terminology Database for Europe [23] and Latvian National Terminology Portal (Latvijas Nacionālais terminoloģijas portāls) as well as the Academic

terms database AkadTerm (Akadēmiskā terminu datubāze *AkadTerm*) [24]. All three are considered trustworthy primary sources;

2. then search the Microsoft language portal [25], where Microsoft terminology can be found and evaluate results with a more critical approach;
3. then look whether the term appears in already translated legal acts, in parallel texts, for example, Linguee (a search engine for legal acts) [26], if it is not present or is translated, but it seems to be incorrect;
4. then look for books in the digital format or physical format in the Latvian National Library (this point does not usually apply to IT terminology because books do not keep up with the times, but we use them a lot in other industries, e.g. chemistry, energy, and others; it is mentioned for the sake of order);
5. then search in the texts found on the Internet (most often, there will be publications in scientific journals, also dissertations, master's theses, and others; they usually have a summary in a foreign language, or the authors, in many cases, indicate in brackets the terms in English).

Table 3

Searching for already existing terminology units

Source type	Source title	Source URL
Terminology database	Interactive Terminology for Europe	https://iate.europa.eu/
Terminology database	Latvijas Nacionālais terminoloģijas portāls	https://termini.gov.lv
Terminology database	Akadēmiskā terminu datubāze AkadTerm	http://www.akadterm.lv/term.php
Terminology database	Microsoft language portal	https://www.microsoft.com/en-us/language
Search engine	Linguee	https://www.linguee.com/

If term is not found, then the terminology formation process begins.

Let us take a closer look at the way terminology *formation* process in the EU is carried out (please, check Table 4). First of all, we search for definition (if it is already given in the law) or look for it in:

1. Interactive Terminology for Europe (it may already be created in other languages, and the English term is already defined);
2. the ISO standards database [27];
3. Technology Dictionary [28], The Government of Canada's terminology and linguistic data bank [29], Encyclopedia Whatis [30], in Wikipedia [31] and similar databases and glossaries;
4. if the definition cannot be found, we are looking for articles and other information; in other words, we are trying to understand what it is.

Speaking about secondary term creation process, DGT.C.LV.2 almost always creates "technical" terms using calque or borrowings. In addition, sometimes calques are created not from the source language (English) but from other languages (German, French and others) if it is possible to create a more understandable term. An important aspect here is the translatability of the new term, as professionals often already know the English term. When rendering such terms, the aspect of euphony seldom is considered, but only whether it will be understandable to the target audience and usable in sentences (which sometimes leads to the creation of slightly strange collocations).

Summing up the current secondary terminology-creation processes described by Jānis Cīrulīšs and Agnese Apse-Apsīte, the activities listed below could be automated to optimize the term creation process.

In the source language (English), searching and returning results for:

1. the term definition in monolingual English-English dictionaries;
2. the source-language texts;

3. various databases – ISO, IATE and others.
- In the target language (Latvian), searching and returning results:
1. English-Latvian dictionaries;
 2. Parallel texts in Latvian from search engines;
 3. Synonym dictionaries in Latvian (Letonika, Tezaurs and others).

Table 4
Terminology formation process

Source type	Source title	Source URL
Terminology database	Interactive Terminology for Europe	https://iate.europa.eu/
Terminology database	The Government of Canada's terminology and linguistic data bank	https://www.btb.termiumplus.gc.ca
ISO standards database	International Organization for Standardization	https://www.iso.org/obp/ui/#home
Dictionary	Technology Dictionary	https://www.techopedia.com/dictionary
Encyclopedia	WhatIs.com	https://www.techtarget.com/whatis
Encyclopedia	Wikipedia	https://www.wikipedia.org

6. Future research: potential development of the ICT secondary-term formation

In order to keep the Latvian language alive, we have to keep creating terms; it is not enough to keep up with the constant influx of new ICT terms that should be created in Latvian. We have to change and optimize the way we prepare terms for secondary term-formation, automating as much as possible from the abovementioned processes both in the source and target languages.

Let us do simple mathematics: in the past two years (since 2019), we have worked mainly with the current ISO standard (ISO/IEC/IEEE 24765:2017(E) ISO Systems and software engineering vocabulary), and there are more than 4500 term units. We have two ITTEA commission meetings per month; in each meeting, we accept, on average, 20 terms. Hence, each month, approximately 40 secondary terms in Latvian are created, thus meaning approximately 400 terms per year. It means we can estimate the completion of the current ISO standard around the year 2030.

Thus, several avenues exist for future research of at least partially automating ICT terminology creation into Latvian.

First of all, although there has been successful voting for various terms on the *AcadTerm* homepage (for example, the term “clickbait”) and Facebook group for translators, it could be helpful to create and use an online voting mechanism designed especially for ICT field professionals here in Latvian, in Baltic countries and the European Union.

Second, even though, as far as we are aware, we have not adopted anything from Estonia or Lithuania in the term formation and introduction process, still it would be interesting and useful for future research to contact colleagues from Baltic and other countries and inquire about their experience in term formation and dissemination process.

Finally, we are determined to examine existing research on translation automation (and translation automation per se) in more detail to determine what could be applied for partial automation of the secondary terminology creation process. Thus, it would be rather valuable to research CAT tools (Translations SDL Trados and others) to evaluate what could be used from their experience to facilitate Latvian ICT terminology development.

7. Conclusion

We conclude the article by emphasising the necessity for further research in the automation of secondary-term creation.

It can be presumed that even if we are highly selective about terms we choose to form in Latvian, the exponential development of terms in the IT field exceeds our capacity to re-creating them. Therefore, further research into the possibilities of pre-processing terms for secondary term-formation could: reduce the manual effort when searching for term definition and context, enable faster decision-making regarding terminology and, in the future, might provide the possibility for improving the maintenance of term consistency.

Thus, to be fluent in the ever-changing and rapidly developing world, aiming to create and integrate the appropriate ICT terminology as much as it is needed (and not only as much as possible right now) is one of the possible aspects that might facilitate more precise machine translation in the future and thus enable continuous survival and development of Latvian, Lithuanian, Estonian and other languages.

8. References

- [1] I. Zauberga, Tulkošanas teorija profesionāliem tulkiem un tulkotājiem, 2016. URL: https://www.rakstiskatulkosana.lu.lv/fileadmin/user_upload/lu_portal/projekti/rakstiskatulkosana/Tulkosanas_teorija_Zauberga_LAT.pdf.
- [2] Merriam-Webster Dictionary, 2022. URL: <https://www.merriam-webster.com/dictionary/term>
- [3] J. C. Sager, Practical Course in Terminology Processing, John Benjamins Publishing Company, Amsterdam/Philadelphia, 1990.
- [4] Cambridge Dictionary, 2022. URL: <https://dictionary.cambridge.org/us/dictionary/english/computer>.
- [5] Akadēmiskā terminu datubāze AkadTerm, 2022. URL: <http://www.akadterm.lv/term.php?term=dators&list=&lang=&h=>.
- [6] K. Kageura, Theories 'of' terminology: A quest for a framework for the study of term formation, *Terminology* 5:1 (1998) 21-40. doi:10.1075/term.5.1.04kag.
- [7] G. Floros, S. Grammenidis, Secondary term formation in Greek, *Terminology* 18:1 (2012) 86–104. doi: 10.1075/term.18.1.05flo.
- [8] M. Koliopoulou, Term formation under the prism of linguistic purism, *International Journal of Lexicography*, 1–15. (2020) doi: 10.1093/ijl/ecaa003.
- [9] S. Postolea, From regularities to norms in the secondary formation of Romanian ICT terms, *Linguaculture*, 2. (2012) doi: 10.1515/lincu-2015-0004.
- [10] R. Widyalankara, The Expediency Hypothesis and modes of secondary term formation in ICT terminology in Sinhala: A bilingual corpus analysis, 2015. URL: https://www.researchgate.net/publication/282656961_The_Expediency_Hypothesis_and_modes_of_secondary_term_formation_in_ICT_terminology_in_Sinhala_A_bilingual_corpus_analysis.
- [11] W. M. Mojapelo, An investigation of term creation in Northern Soho, 2018 URL: http://ulspace.ul.ac.za/bitstream/handle/10386/2327/mojapelo_wm_2018.pdf?sequence=1&isAllowed=y.
- [12] The Routledge Handbooks Online, The Routledge Encyclopedia of Translation Technology, Computer-Aided Translation, 2022. URL: <https://www.routledgehandbooks.com/pdf/doi/10.4324/9781315749129.ch3/1654968125773>.
- [13] Post-editing of Machine Translation, 2014. URL: <https://termcoord.eu/wp-content/uploads/2013/08/Post-editing-of-Machine-Translation.pdf>.
- [14] A. G. Arenas, Pre-Editing and Post-Editing, 2020. URL: https://www.researchgate.net/publication/338310852_Pre-editing_and_post-editing.
- [15] Machine Translate Website, 2022. URL: <https://machinetranslate.org/eamt2022>.
- [16] A. Veisbergs, Latviešu valoda kā tulkojumvaloda, LU Akadēmiskais apgāds, Rīga, 2021.
- [17] The Institute of Mathematics and Computer Science, University of Latvia Website, 2022. URL: <https://www.lumii.lv>.

- [18] Institute of Electronics and Computing Website, 2022. URL: <https://www.edi.lv/>.
- [19] Nacionālā enciklopēdija, Datorzinātne Latvijā, 2022. URL: <https://enciklopedija.lv/skirklis/8980-datorzin%C4%81tne-Latvij%C4%81>.
- [20] D. Šostaka, J. Borzovs, E. Cauna, I. Keiša, M. Pinnis, A. Vasiljevs, The Semi-Algorithmic Approach to Localizing English Information and Communication Technology Terms into Latvian, *Baltic Journal of Modern Computing* (2022). To appear.
- [21] V. Skujiņa, Latviešu terminoloģijas izstrādes principi, 2002. URL: <http://www.vvk.lv/?sadala=217>.
- [22] Latvijas Enciklopēdiskā vārdnīca, Cīrulis Jānis, 2002. URL: <https://www.letonika.lv/groups/default.aspx?r=1&q=c%C4%ABrulis&id=935887&g=1>.
- [23] Interactive Terminology for Europe, 2022. URL: <https://iate.europa.eu>.
- [24] Latvijas Nacionālais terminoloģijas portāls, 2022. URL: <https://termini.gov.lv>.
- [25] Microsoft Language Portal, 2022. URL: <https://www.microsoft.com/en-us/language>.
- [26] Linguee, English-Latvian dictionary, 2022. URL: <https://www.linguee.com/english-latvian/>.
- [27] ISO standards database, 2022. URL: <https://www.iso.org/obp/ui/#home>.
- [28] Technology Dictionary, 2022. URL: <https://www.techopedia.com/dictionary>.
- [29] The Government of Canada's terminology and linguistic data bank, 2022. URL: <https://www.btb.termiumplus.gc.ca>.
- [30] Whatis.com, 2022. URL: <https://www.techtarget.com/whatis/>.
- [31] Wikipedia, 2022. URL: <https://www.wikipedia.org/>.