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Peculiarities of translation of English technical terms

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Abstract. Modern linguistics manifests an increased interest to the study of particular sublanguages serving specific fields of professional activity. The attention of linguists to languages for special purposes is primarily due to the growing number of terms in various sciences. The spread of terminological vocabulary in everyday speech outside communicative situations related to professional activities is a distinguishing feature of our time. In current conditions, the use of terms is no longer the prerogative of specialists in a specific field. This trend is also valid in relation to the vocabulary of technical discourse, since technical terminology is regularly used in a variety of contexts and it is continuously developing in the conditions of modern technical progress. The article considers the structural and semantic features of the English terminology used in technical texts and ways of translation English terminology into Russian. The study of terminology peculiarities is based on the material of technical literature due to its extensive use in modern life and production. Furthermore, the growth of production, science and technology is an important source of new terms, not yet recorded in the dictionaries. New terms appear to create significant difficulties if you need to translate them into another language.

1. Introduction

The relevance of the issue under consideration is related to the rapid development of various areas of scientific and technical knowledge, which is accompanied by new notions formation, followed by their naming and coining the so-called term. Today, there are many dictionaries in specific fields of science and technology, containing tens of thousands of words, but none of them is able to provide a translation of all the terminological units existing and newly coined within this branch.

Modern Internet resources allow you to perform a fairly complex translation by means of empirical identification, i.e. by searching for matching pairs of terms in different languages. For example, one can search for matching of German and English versions of a certain term with corresponding notion thus formulating the corresponding Russian equivalent, by means of perceiving the meaning of the term through pictures found in various search bases. These translation operations are usually carried out at the end of the first viewing of the text, take a long time and do not always lead to the desired result. Therefore, again and again, the translator has to turn to the study of the peculiarities of term translation which existed earlier or have appeared recently in connection with new lexical units coining.

2. Literature Review

Before proceeding to the study of term translation issues in scientific and technical texts, we are to consider the definition and linguistic nature of the term. According to O. S. Akhmanova, the term is a word or a word combination of a specific language, coined (accepted, borrowed, etc.) for the exact expression of specific notions and denotation of specific objects [1, p. 474]. S. V. Grinev gives a similar definition. According to the researcher, the term is a nominative specific lexical unit (a word or a phrase) belonging to a specific language and giving an exact specific concept name [2, p. 33]. The



aforementioned definitions indicate that the terms are to be unambiguously identified and understood in the context.

According to this requirement, there are two types of terms: 1) general scientific and general technical terms, 2) specific (nomenclature) terms. The former ones serve to denote the general concepts of science and technology, while the latter are part of a certain terminology. As explained by T.M. Dementieva, terminology representing a set of terms is an autonomous part of any national language that is closely related to professional activity. Terms in any branch of science, technology and production form their own systems that have conceptual connections with professional knowledge and express these connections by means of the language [3, p. 61]. If in a common language (beyond the terminology) a word can be multivalent, then, getting into a certain terminology, it acquires unambiguity [6, p. 208].

Thus, the term does not need a context, as an ordinary word, so it 1) is part of a specific terminology that serves as context, 2) can be used in isolation, for example, in the texts of registries or orders in engineering, 3) for this reason it should to be monosemantic not in the language in general, but within the limits of the terminology. Summarizing the available research data, we have identified the following properties inherent to the terms: monosemy, specific meaning; belonging to a certain terminological system; lack of expression.

In lexicological studies, the branch terminological subsystems development issues are of key importance. In the 30s of the twentieth century, terminology studies, a new applied science discipline, the research object of which are terms and terminological systems, emerged from linguistics [4, p. 17]. Everything connected with the notion "term" brings linguistics nearer not only to different fields of scientific knowledge, but also to different fields of professional work. Terminology vocabulary is growing extremely quickly. The significance and proportion of this lexical layer in the general vocabulary are increasing all the time. The terms of specific terminosystems are unified not according to linguistic features, but features external to the language. They represent not a simple family of words, but a system of words or phrases organized in a certain way [5, p. 28].

The most important problem in achieving translation equivalence of scientific and technical texts is the reproduction of the original content of the text using the terminological system of the target language. The difference in the terminological systems of the source language and target language is the cause of the greatest difficulties in translating scientific and technical texts. Hence there is need to study the term systems and find ways to translate partially equivalent and non-equivalent vocabulary. The problem of exploring terminology is one of the key issues in the study of scientific and technical texts. A term or a phrase denotes a concept of a special field of knowledge or activity. Identification of differences in the concept system expressed by the terms of the source language and the target language is an important step on the way of term system interlanguage harmonization, providing a solution to the problems of term translation in the fields of their functioning [1, p. 8].

So, terms are units of linguistic and professional knowledge that ensure the intercultural communication effectiveness. For this reason, equivalent translation of terminology is of great significance in the translation of scientific and technical texts [6, p. 138].

3. Results and Discussion

The widely used methods of translation uncommon elements being present in an original text, such as terms, are: search for an equivalent, use of analogues, calquing, transliteration/ transcription, functional sense, descriptive translation and translator's comments [2-10].

1. The search for an equivalent in the target language, i.e. a word that is fully equivalent to its counterpart in the original language. The equivalent should be as short as possible and convey the full volume of the original term meaning. The following metal names can serve as examples: *zinc*, *magnesium*, *copper*, etc.
2. The translation with the help of an analogue is used when an original word has several correspondent equivalents in the target language. It is the most widely used translation method, as the practical mass of words is polysemic. Moreover, it is of great help if a translator deals with

universal technical terms or units, borrowed from commonly used languages. E.g.: *strenght, fatigue, hardness*.

3. Calquing is the reproduction of a combinatorial (but sound) composition of a word or phrase, when the components of a word (morphemes) or a phrase (lexemes) are translated by the relevant elements of the target language. As a translation method calquing served as a basis for a large number of borrowings in the process of intercommunication in cases, when the transliteration was unacceptable for some aesthetic, semantic or other reasons [2, c. 88]. The essence of calquing is making a new word or an idiom in the target language, which replicates the structure of the original lexical unit: *mechanical wear, martensite structures*. In this case the translation can be accompanied by the word order change *wear resistance, grain size*. When calquing, one can use such types of lexical and grammatical transformations as a word type change or explication. E.g. *titanium alloys* (a noun is changed for an adjective), *high-temperature materials* – materials with a high point of melting (the term meaning is clarified, i.e. explicated).
4. Transliteration/transcription. The transcription is a formal phoneme by phoneme reproduction of an original lexical unit with the help of the target language phonemes, phonetic imitation of the original word. The other method is transliteration, i.e. formal letter by letter reproduction of the original lexical unit with the help of the target language alphabet, a letter imitation of an original form of a word. In this case, the original word in the translated text is presented in the form adapted to the pronunciation features of the target language [2, c. 90]. Theses types of translation are mainly used in the translation of proper nouns and names, e.g. *Super Duplex Stainless Steel*, *Charpy impact testing*. Besides, the method combining transliteration and transcription is most commonly used in practice.
5. Sometimes the term that has no equivalent or an analogue in the target language, that would convey its meaning sufficiently, is translated with the help of the words, reflecting its functional sense. For instance, the word shoulder in the texts on metalworking will be translated as a support collar, and a hollow drawbar as a hollow pull stud. The search for the functional relevance turns out to be especially urgent in case of so called nonequivalent lexicon, i.e. words, that are absent in bilingual dictionaries for some reasons. This category often includes neologisms and words denoting objects or phenomena unfamiliar for the culture of the target language that have not come into the dictionaries (realities or culturonyms).
6. Descriptive translation and translator's comments. The descriptive translation, as a rule, is used in parallel with the transcription and is applied when translating terms, culturonyms, unique objects, etc., having no lexical equivalents in the target language. The word meaning is presented by means of a more or less common explanation, made as short as possible. If the description as a translation method usually accompanies the word, presented in a simple form, or even is used instead of the word, the translator's comments are given beyond the text, being mentioned either in the footnotes at the same page or into the endnotes of the text. The comments as a translation method suggests a more detailed (in comparison with the description) explanation of what the original word means in a wide context of the original culture. There is also a translation method, by which units of the original language get into the translation. It mainly concerns various acronyms, abbreviations, and terms, such as types of equipment, e.g. I-Stir PDS machine, or materials (alloys X-65, AL-6XN, etc.).

Thus, translating terms, different in lexical composition, is practically difficult, as it requires from a translator both understanding of the original term meaning and the knowledge of its possible counterparts in the target language.

The terms can be polysemic, synonymous and homonymous. Regarding their form all the terms can be divided into: 1. Simple – *circuit, flexibility*. 2. Complicated – *flywheel, nonlinear, non-waste*. 3. Word combinations – *circuit breaker, nonmetallic inclusions, diverse scale process, heat and mass exchange, wide spectrum properties*. Terms – word combinations are the most difficult to translate, as the words comprising them are independent. The components of such terms can be distinguished as separate units. For instance, *brake gear, electric motor, powder materials*. The most difficult for the

translation are: a) the terms, whose meanings come from the integration of two words *load governor*, *brake landing*; b) the terms, whose components are linked by means of grammar elements, e.g. *ways of measurement*, *body of reactor*, *breaking with rocket*, *lid of frame*. Among the other types of the terms, the word combinations of the following constructions are the most difficult: a) noun + noun, e.g. *back – coupling*; *variable – capacitor*; *peak – energy*; *phase transition*, *percussion waves*; b) adjective + noun, e.g. *remote control*; *safety switch*; *direct current*; c) participle I + noun, e.g. *altering current*; *calculating theory*; d) participle II + noun, e.g. *estimated cost*, *unbounded stream*. If the second component or both of them are common in use, their translation is not difficult. For instance, *safety switch*, *line wire*, *thermal stress*.

One should mind, that one and the same word form can have different meanings in several branches of one and the same scientific or technological sphere. The word *fuel* has a meaning of fuel in power engineering and a meaning of atomic fuel in atomic engineering. Thus, when translating technical terms, a translator should stick to the topic of the text to avoid the wrong variants of translating the homonymous term. One should lay a special emphasis on the translation of not only general scientific, but also non-diversified technical terms when working with English scientific and special technical texts. A certain problem lies in identifying the peculiarities of usage not of general vocabulary, but of specific terminology of scientific and technical texts and, consequently, the development of acceptable options for their translation into Russian language as the Russian scientific vocabulary differs significantly from English technical lexical forms. As a rule, Russian translations of the sentences, that illustrate the use of these technical terms in their contexts, reflect the essence of the author's sources, whereas specialized English terminology should be translated taking into account the present general context of the original source.

A comparative analysis of English-Russian translations of scientific and technical literature shows that a considerable number of translation errors can be found in the use of scientific vocabulary, they can be both the errors in choice of the wrong terms in translation, and the cases of wrong interpretation of terminology phrases. The latter case demonstrates the most widespread situation for errors in translation, because it is easier to translate a single term than to understand its original terminology link within the given author's context. It should be mentioned that it is almost impossible to consider all the nuances of translation difficulties that could emerge in the translation process, but we should highlight at least some of them. Without the right use of terms it is impossible to understand the author's ideas, the way the devices or some mechanisms work in some industry. And here, a translator may face a number of unexpected difficulties, even despite the use of specialized dictionaries.

In some cases, the translation is simplified by the fact that there is an English term, and there is a precise Russian translation. Let us take term "*water*", for example. It is clear that the fantasy of an interpreter should be completely excluded in doing the translation, as this term implies a molecule consisting of two atoms of hydrogen and one atom of oxygen. We cannot deny or argue this law. Similar terms can be, for example, *barograph*, *ozone*, *centigrade*, *gyroscope* and others.

But often translation activity is characterised by the occurrence from minor to significant difficulties in translation when a term has in a heterogeneous interpretations, for example *power – strength*, *electrical energy*; *line – line*, *cable line*. This fact makes the translation of English technical terms more complex.

But there can be more complicated cases, when a creative approach is needed from the interpreter, considering his/her scientific and technical training, for example, the word "*motor*" can be translated as a word "*motor*", or as a word "*engine*", or as a word combination "*to operate in the mode of engine*". There may be found many other examples as well, for e.g: a term "*a handle*" can be translated as "*a control lever*" and "*a handgrip*", a verb "*to handle*" can be interpreted as "*to operate*, *to manipulate*, *to serve*"; a term *generator* as "*a generator*" and a verb *to generator* as "*to work in a generator mode*"; a term *to increase* as "*to rise*, *to enhance*"; a verb *to record* can be interpreted as *to register*, *to put down* and a noun *a record* as *a note*, *registration*; a term *empty* as

hollow and its verb *to empty* as *to eviscerate*, etc. And there can be found many other cases of different ways for interpretation of one and the same term.

In some cases, the prefix is added to the English term and then the adequate translation may bear the opposite meaning to the original term, for example: *im-* (*impossible*); *counter-* (*to counteract*). Technical English literature abound in terms which were formed by adding the separate words, but being in a terminological unit they may indicate a single concept, for example: *sliding bearing*, *correction for displacement*.

Different meaning can be found in such examples as: *treatment of water*, *a water treatment*. So, these two, "the same" combinations of terms have different semantic meanings, and, respectively, they have different understanding of process technology. The same term may occur in technical English texts, but is used in its translation in different semantic meanings depending on the field of technical knowledge which is used: aviation, marine, electrical equipment, etc. That is, a specific term carries an entirely different meaning depending on its specific use. For example: *pocket* has the following special meanings in interpretation: *air pocket* (in aviation); *surroundings* (in military affairs); *the dead zone* (in radio); *a deposit* (in geology); *a cable channel* (in electrical engineering); and there are many similar terms. When working with the text, a translator should avoid so to say his own general vocabulary, but pay attention to the use of terms.

Another problem which an interpreter may face is that there can be various abbreviations in the original which can be seldom found in a Russian-language text, such as: a. c. (*alternating current*), PP (*peripheral processor*). Of course, when dealing with such a text, a translator should give a full meaning of abbreviation. An accurate translation of abbreviations can be found to some extent in specialized dictionaries.

One more difficulty in translation technical terms is the translation of terms which are different in their semantic meaning at the first sight. Here can arise a number of nuances, for example:

- a single term is a part of another one, e.g.: *valve amplifier*,
- both terms are independent, but in their semantic meaning, they present a single notion, for example: *machine frame*,
- a term attributes the second feature to another one, for example: *machine weight*, *motor vibrations*, *bronze washer*, etc.

Conclusions

Without a specific understanding of the term it is impossible to understand the message of the idea described by the author of the text. However, if a term and its specific semantic meaning are more common for the Russian language, then the term in the English technical literature can have a rather multifaceted value: from the specific translation to the translation, requiring scientific literacy of the interpreter. Thus, the best technical translation of the English text into Russian is mainly determined by the general polytechnic training of the interpreter, the knowledge of the interpreter's area of expertise. First and foremost, one needs to remember that the translated technical terminology in a specialized text is full of various difficulties we mentioned above. In conclusion it should be noted that for the adequate translation of the authentic scientific and technical texts, containing a large number of special terminology requires accuracy and unambiguous understanding that can provide interpreters with the high level of linguistic and professional skills.

References

- [1] Ahmanova O S 2004 *Slovar' lingvisticheskikh terminov. Dictionary of Linguistic Terms* (Moscow: Editorial)
- [2] Bauer L, Nation I S 1993 Word families. *International Journal of Lexicography*, **6** (4) 253-279
- [3] Chung T M, Nation I S *Identifying Technical Vocabulary*
- [4] Horace B, Ava Champney 1958 *A Comprehensive Dictionary of Psychological and Psychoanalytical Terms* (New York: Longmans, Green and Co.)
- [5] Grinev S V 1991 *Terminology and Scientific Cognition* (Moscow) **1** 15-27

- [6] Hanks P 1984 *Collins dictionary of the English language* (London: Collins)
- [7] Jastrzembski J Multiple meanings, number of related meanings, frequency of occurrence, and the lexicon. *Cognitive Psychology* 198 **13(2)** 278–305
- [8] Lotte D S 1968 *Kak rabotat' nad terminologiej. Osnovy i metody*. How to work on terminology The rules and methods. (Moscow: Nauka)
- [9] Marchuk J N 1992 *The Basis of Machine Translation* (Moscow)
- [10] Pearson J 1998 *Terms in Context* (Amsterdam)