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The means of cognitive information conveyance in technical translation

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Abstract. The purpose of this article is to review various approaches to translation of cognitive information in English technical text into Russian. The focus of this study is to specify the equivalent translation strategies used to convey English technical terms and abbreviations being the source of cognitive information. The analysis of the empirical material, i.e., the original and translation of the English photographic equipment manual, revealed that, possible equivalents, equivalent counterparts and such translational transformations as omission of redundant elements, lexeme addition, generalization, semantic modulation and complete transformation are predominant choices. We have described the following two basic strategies for translating abbreviations. The first one is applied to common, frequently used technical terms and actualizes the reference to the dictionary equivalents; the second strategy is applied to terms specific for the analyzed photo printer manual and results in the use of the source text words.

1. Introduction

Translation plays an important role in the cultural development of mankind. Through translation, people in one country learn about life, daily routines, history, literature and scientific achievements of people in other countries. The expansion of economic and trade relations between nations as well as the development of scientific and technological progress contributes to the increase of technical texts ratio among total volume of translated materials. This results in greater attention from the modern translation studies community to the problems of technical translation [1; 2; 3; 4]. This fact also confirms the relevance of this article.

In addition, modern linguistic concepts recognize the cognitive aspect as basic and essential in the scientific text structure and semantics. This fact fits perfectly into modern linguistics and translation studies.

2. Material and Methods

The research material is the original and translation of the English manual for photographic equipment (Konica Minolta Photo Imaging, inc. No. 1 Sakura-machi, Hino-shi, Tokyo 191-8511, Japan). The conclusions material is examples card file, extracted from the text and containing 175 terms and 67 abbreviations.

The primary research method is comparative analysis of the source and target texts aimed to establish equivalent counterparts. Also, we analyse dictionary definitions to evaluate correctness of terminology and abbreviations translation. In addition to it, we apply contextual analysis to study lexical transformations in terms of achieving equivalence when dealing with translation of the English



terminological word-groups. Finally, we employ general scientific analysis, synthesis and description methods.

3. Results and Discussion

The dominant stylistic feature of any technical text is an accurate and clear material presentation. Expressive means with emotional coloring are nearly absent, whereas the main emphasis is on the logical rather than the emotional side of the subject [5; 6; 7]. Hence the importance of cognitive information for a scientific text [8; 9; 10]. Characteristic features of the technical style include meaningfulness, logic (strict consequentiality, clear coherence between the basic idea and the details), accuracy, objectivity, clarity and apprehensibility. Various technical texts may possess these features to a greater or lesser extent, yet they all contain linguistic means aimed at providing professional communication between the members of scientific and engineering communities. In the lexical aspect, it involves the use of technical-scientific terminology and special lexis.

As a result of the technical text study, we define its main stylistic feature as accurate and precise material presentation without any expressive elements that add emotional coloring to the utterance. Metaphors, metonymic transpositions and other figures of speech, widely used in fictional works, are seldom found in scholarly literature. Being stylistically antipathetic to common language, technical texts still may contain a number of "colour-free" technical phraseological combinations. The scientific-and-technological translation should meet the following requirements: accuracy (correct representation of all thesis in the source text); conciseness (concise and succinct conveying); clarity (compactness of the target text should not hinder its comprehension); literariness (translated text must comply with conventional norms of the target language).

In this research, we found upon modern translation theorist G D Voskoboynik and his scientific work "Linguophilosophical Foundations of the General Cognitive Translation Theory". Applying cognitive approach, he described how a distinctive text type influences the equivalence / adequacy ratio in translation. Thus, we regard equivalence as conveying cognitive information by contrast with adequacy, which conveys emotional and evaluative information: "The equivalence of translation is typical for texts with the communicative purpose of changing the addressee's practical activities. The scientific and technical texts, device manuals etc. are exemplary for the "Actions" realm. The concept of adequacy, on the other hand, exists in an axiological context, therefore translators of poetry and fiction in general refer to adequacy" [11]. Translated technical text should correctly convey the meaning in a form that as much as possible close to the initial one. Any deviations have to be justified by peculiarities of the Russian language as well as by style requirements. The translation should not be neither word-for-word nor a loose adaptation, although elements of both are inevitably present. To make the Russian technical text equivalent to its English original, it is essential to convey the original cognitive information, presented in the following parameters:

- translation of terms;
- translation of abbreviations.

As the basic definition of a term, we adopt the one suggested by L M Alexeyeva: "A term is a word or a phrase that denotes a concept (object, phenomenon, property, relation, process) and is specific to a given branch of knowledge, technology, art or public life" [12]. The material analysis revealed that the preponderance of the technical text vocabulary are terms with all their typical attributes: unambiguity, neutrality and context insensitivity.

According to our research, possible, i.e., optional equivalents predominate in term translation. Thus, within each particular word meaning, one of the regular term translation techniques is applicable:

*Press the yes **key**. - Nazhmite **klavishu** "yes".*

*Are the **rollers** stained or damaged? – Est 'li zagryazneniya i povrezhdeniya **valikov**.*

*Be sure to clean the magnetic **head** after completing the daily printing work of 240 **film**. – Obyazatel'no ochistite magnitnuyu **golovku** posle ezhednevnoj obrabotki 240 **plenok**.*

*Remove any **play**. – Dvigajte sektsiyu vpravo i vlevo dlya ustraneniya **lyufta**.*

To convey cognitive information represented by terms in English manuals, we often use calquing, i.e., morpheme-for-morpheme or word-for-word translation. Calquing is sometimes accompanied by lexical extension, which is decomposition of the original complex word into constituents, i.e., individual words in the target language:

*Set the 135 ANS on the **turntable**. – Ustanovite 135 ANS na **povorotnyj stol**.*

In most cases, the number of lexemes involved in calquing remains identical in both the source and the target language. However, parts of speech alter in the target language. Thus, English attributive nouns are replaced with attributive adjectives in Russian:

*Raise the mirror cover and draw out the **mirror tunnel**. – Podnimate kryshku zerkala i vytashhite **zermal'nyj tunnel** '.*

*Set the **calibration plate** on the densitometer. – Ustanovite v densitometr **kalibrovochnuyu platinu**.*

In translation of terminological phrase components, the cases of the part-of-speech altering are frequent. As a rule, when parts of speech remain unaltered, the change of word order occurs:

*Cleaning the **Exposure System** - Ochistka **sistemy ehksponirovaniya***

Sometimes, terminological phrase translation is accompanied by the use of translation transformations. One of them is the addition of lexical units specifying the denotative properties of the described object (in the following example, the word “ob'ektiva” is added), another one is the omission of repeating lexemes (the words “poverkhnosti”):

*Do not touch the **mirror surface** and **lens surface** with you bare hands. – Ne prikasajtes' golymi rukami k **poverkhnosti zerkala i linz ob'ektiva**.*

The terms are also transmitted into the Russian language by means of transliteration:

*Check for any stains and scratches on the **diffuser**. - Prover'te **diffuzer** na predmet otsutstviya zagryaznenij i tsarapin.*

*This display shows the Auto Setup method by using the optional build-in Konica **Densitometer**. – Na ehkrane otobrazhaetsya rezhim avtomaticheskoy nastrojki vstroennogo **densitometra** Konica.*

As mentioned, in some instances, the cognitive information in English technical terms is translated by means of various transformations. To describe them, we use the classification by V N Komissarov [13], given that this classification is the most common in translation studies and reflects well the logic of our study object. In the following example, the omission (film-film) and the addition (the word “podachi”) are utilized simultaneously:

*Remove the **negative film carrier**. - Snimite **ustrojstvo podachi negativov**.*

The omission technique is quite frequent (in this example, the word “size” is omitted):

*In case to operate the moveable **mirror for 120 size**...– Dlya podvizhnogo **zerkala 120 ispol'zujte**...*

Sometimes, semantic modulation occurs. In the following example, we translated the word “values” as “znachenie”, although the dictionary only contains the following meanings: “tsennost'”, “stoimost'”, “vazhnost'”:

*Enter adjusted **values**. – Vvod kalibrovochnykh **znachenij**.*

In the examples below, we applied such type of transformation as generalization, using a more general concept in the target language than the one in the source language:

*Use the **ten-keypad** to enter the Y, M and C values in order. – S pomoshh'yu **tsifrovoj klaviatury posledovatel'no vvedite znachenie dlya Y, M i C**.*

*Open the upper cover of the **processing section**. – Otkrojte verkhnyuyu panel' **protssora**.*

In the following example, descriptive translation was employed in order to maintain the conventional structure of a technical manual used in the target language:

*Check items. – Na **chto obratit 'vnimanie**.*

In this text fragment, the conventional norms of the target language require a holistic form transformation.

Next, we review abbreviations as ways of explicating the cognitive information in a technical text. In our opinion, the most accurate definition of abbreviation is provided in the scientific work by E N

Ozhogin: "Abbreviation is the process of creating the secondary naming units, which entails reducing the linear length of the original name and, after applying a number of formal operations, resulting in a reduced structural version of this name" [14].

In modern linguistics, the fundamental classification of abbreviations, i.e., according to their structure, is traditionally represented as follows:

1. syllabic – part or parts of a single word;
2. multi-syllabic, comprising words with reduced linear length as well as full words;
3. initial, comprising the initial letters (sounds) of words in the abbreviated phrase [15].

The abbreviations of the three types reviewed are found in English manuals and function as cognitive information carriers. An abbreviation poses a problem for translator only when the meaning of its denotation is unknown. Otherwise, its cognitive elaboration during translation does not differ from elaboration of any other terminological lexeme.

Defining the complete form of abbreviations itself does not present a particular difficulty for the translator. Many of the so-called morphological abbreviations are intuitively comprehensible (*ERR*, *Func*), and most abbreviations in general, including initial (*ml*, *ANC*), are listed in established dictionaries, as a rule at the end, in a typical appendix, as well as in special abbreviation dictionaries, containing more specific scientific abbreviations.

Consequently, the challenges in translation of such lexis are not of semantical nature: even with a clear meaning defined, finding an equivalent-counterpart, or an interlingual synonym, is usually not an easy task. Being a word, according to expert opinion, the abbreviation should on an equal basis comply with the lexis translation rules. These rules are based on semantical correspondences between the correlative units of a given language pair. Similarity to terms, i.e., the absence of connotations, further highlights the importance of conveying the meaning of abbreviations. Strictly schematically, source language word

1. is translated – its meaning is transmitted by appropriate means of the target language (equivalents, counterparts) or
2. is transferred to the target text as original, partly or fully preserving its form (loan word, transcription, transliteration).

However, the abbreviation is a peculiar word, different from other words. In the same way that a stenograph functions as a representative, a substitute of an ordinary word, the abbreviation represents a different unit, potentially contained in it and the original one, from the "fragments" of which it is composed.

In the course of the technical manual original and translation analysis, we encountered two main types of cognitive information transmission using abbreviations. We believe that translator should convey the cognitive information to the fullest extent possible in a given communicative situation. This fact determines the strategy for transmitting this type of information using abbreviations. Those containing standard and frequent for any technical text data, are translated into the target language by means of equivalent abbreviations. On the other hand, the abbreviations, determined by the specifics of this particular photo printer manual, are included in the Russian text as the source text words in their original form (foreignisms). The latter group comprises device model names and the photo printer part names displayed during device performance as well as the comments in the source language, provided in the manual. These English comments are copied as original into the manual translation so as to make device user feel confident while using the translated text.

Let us take a look at some examples of the abbreviation translation.

As we have mentioned, conventional abbreviations of length and volume measures are transmitted into the target language by means of equivalent abbreviations, i.e., fixed equivalents consisting of initial letters in a morpheme or a word:

Use the monitor at the distance of 80 cm in a bright room. – Ispol'zujte monitor v osveshhennoj komnate na rasstoyanii 80 sm.

Do not position any lighting fixtures within 2 m from the operation table. – Ne razmeshhajite nikakikh osvetitel'nykh priborov v predelakh 2 m ot rabocheho stola.

The temperature parameters of the corresponding processes during equipment performance are translated into Russian, as well as into English, by means of conventional Latin alphabetic acronyms:

Operate this system under an ambient temperature of 18°-28° C. – Trebovaniya k okruzhayushhej srede, v kotoroj budet ehkspluatirovat'sya sistema, komnatnaya temperatura 18°-28° C.

Volume measures are usually transmitted into the target language by means of fixed equivalents, i.e., the initial morpheme equivalents:

Should tablets or processing solution be swallowed, rinse you mouth out with water or drink one or two cups (180 ml) or more of water. – V sluchae popadaniya tabletok ili obrabatyvayushhikh rastvorov v organizm propoluskajte rot ili vypejte odin-dva stakana vody (bole 180 ml).

Some abbreviations in English manuals are transmitted into Russian as full-word counterparts. In particular, this applies to a common Russian lexeme “naprimer”:

*In case of any problems in the cutter section (e. g., blade sharpness). – Neispravnost' v seksii rezaka (**naprimer**, lezviya zatupilis').*

Sometimes, as shown in the example below, English conventional non-technical abbreviations are transferred into the target language as foreignisms:

*When judgment is “Almost **OK**” or “Once again”, press the yes key to make another test print and enter it until the judgment becomes **OK**. – Esli rezul'tat sravneniya “Almost **OK**” ili “Once again”, nazhmite klavishu yes dlya polucheniya drugogo testovogo otpechatka i vvoda ego v ustrojstvo, poka rezul'tat ne stanet “**OK**”.*

A photographic equipment manual often contains abbreviations of the parameter names seen on the computer display during device operation. Such abbreviations are transmitted in translation as original, i.e., in Latin letters, so that device user can respond to the messages adequately:

*Should “**WARN-0121**” be displayed when “Light Compensation” is selected... – Esli v rezhime “Kompensatsiya sveta” vydano preduprezhdayushhee soobshhenie “**WARN-0121**”...*

In other cases, a full lexeme in the source language is translated as a syllable abbreviation. In the analyzed text, such is the case for the word “page”, which is abbreviated in the Russian version, perhaps because the Russian word “stranitsa” is much longer than its English counterpart:

*“Cleaning Inside the Printer” (**page** 3. 32) – “Ochistka vnutrennej chasti printera” (**str.** 3.32)*

Many abbreviations in the technical text refer to the device model and series. In the analyzed text, they constitute a majority (65%) and are always transmitted into the target language as foreignisms:

*Maintenance and Inspection of the **ECOJET** component. – Osmotr i ochistka zheloba **ECOJET**.*

*Thank you for purchasing the **NPS-838 Super-SQA**. – Blagodarim Vas za priobretenie sistemy **NPS-838 Super-SQA**.*

In manuals, there is always a group of abbreviations denoting technical characteristics of a certain ongoing process. They are often transmitted into the target language as full equivalents, with the original abbreviation, i.e., a foreignism, given next to it:

*For **ERR-0212** [Paper Jam Processor Exit] Display. – Oshibka **ERR-0212** (Zamyatie bumagi na vykhode iz protsessora).*

In some cases, the abbreviations of this type keep their original form in the translated version, and their complete form is provided further in the text:

*Writing file data (**PP**→**FD**) – Zapis' dannykh v fajl (**PP**→**FD**)*

In the example above, the lexemes “Printer Processor” and “Floppy disc” are further translated as full-form words “printer-protessor” and “disketa”.

*Remove the **Auto Negative Carrier** (**ANC**) from the main unit. – Otsoedinite **avtomaticheskoe ustrojstvo podachi negativa** (**ANC**).*

Thus, it is possible to transfer the complete term form and its bracketed abbreviation in both the source and the target languages. Moreover, the full version is translated by the use of calquing, whereas the contraction is conveyed in its original form. In such cases, further in the text the abbreviation functions without its full form.

4. Conclusion

The analyzed text evidently belongs to the category of technical texts and therefore provides an accurate material presentation with the main focus on the logical rather than the emotive side of the message. In this article, we have specified most distinctive features of the scientific-technical style of writing. They are: informativity (thoroughness), logic (strict consequentiality, clear coherence between the basic concept and details), accuracy, objectivity, and, subsequently, clarity and comprehensibility.

We recognize terms and abbreviations as primary markers of cognitive information contained in English technical texts. As our studies have shown, possible equivalents constitute the predominant means of term translation (55%), i.e., to convey the precise meaning into Russian, we apply one of the regular translation techniques for each particular word meaning as opposed to a fixed equivalent, which is a ready-to-use solution and is easily found in a dictionary. Calquing of terms (12%) is also a common method for conveying cognitive information in technical manuals. This technique comprises morpheme-for-morpheme or word-for-word translation, which is sometimes accompanied by lexical extension, i.e., we decompose the original compound into words-constituents of the target language. However, applying this method, translator should pay special attention to maintaining the authentic meaning of the initial compound and correctly define the semantic core (i.e., the central word) of the Russian phrase. The terms, which fall under the category of fixed equivalents (counterparts) are transmitted into Russian by means of transliteration (15%).

In some cases, we applied translation transformations. To describe them, we adopted the classification by renowned Russian translology theorist V N Komissarov, given the fact that his arrangement is considered most common and respected by the scholars in the field of translation studies. This classification reflects well the logic of our study object. The analysis of the empirical data showed that most frequently applied transformations are: omission of redundant lexical units (5%), addition of lexical units (5%), generalization (4%), semantic modulation (2%) and holistic transformation (2%).

Abbreviations are found in English technical instructions and, in conjunction with technical terms, serve as carriers of cognitive information. Translating an abbreviation is not a challenging task for translator, except when the meaning is unknown. Otherwise, its cognitive representation does not differ from the procedure towards any other technical term. We believe that translator should be able to convey cognitive information to the fullest extent possible in a certain communicative situation. Given the fact that a typical technical text is heavily infused not only with terminological lexemes, but also with abbreviations, studying the specifics of their transmission into Russian is essential. In our article, we have listed, according to the established classification, three types of abbreviations, which are: syllabic, multi-syllabic and initial.

Whether dealing with full-word terms or their abbreviations, after the analysis of the original manual and its translation, two main types of conveying cognitive information have proved to be efficient. Thus, the abbreviations denoting a typical and commonly used in any technical text terms are translated through the use of equivalent abbreviations. On the other side, the context-specific abbreviations (in our research, those determined by the specifics of this particular photo printer manual) are transmitted into the Russian text as source text words (foreignisms). This group includes the abbreviations with the device information (e.g., model name, series etc.), the photo printer part names or command signals displayed during device performance and finally, the abbreviations denoting the comments in the source language, provided in the manual. These English comments are copied as original into the manual translation so as to make the device user feel confident while relying on the translated text.

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