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Лингвистические особенности перевода научно-технической литературы с русского на казахский язык, пути и методы формирования системы терминов

Статья написана в рамках лексической структуры сравнительного изучения языков с различной структурой. В статье рассматриваются пути расширения технической терминологии на казахском языке, особенности ее формирования и функционирования, а также особенности ее перевода на русский язык.

Ключевые слова: техническая терминология, формирование, функционирование, перевод, русский язык, казахский язык.

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Linguistic Features of Translation of Scientific and Technical Literature from Russian into Kazakh Language, Ways and Methods of Forming the Term System

The paper is written within the framework of lexical structure comparative study of the languages with different structures. The article considers the ways of expanding technical terminology in the Kazakh language, its specific character of formation and functioning, as well as peculiarities of its translation into the Russian language.

Key words: technical terminology, formation, functioning, translation, Russian language, Kazakh language.

1. Sources and main ways of forming terms in the Kazakh language

As you know, in the process of term formation, the national language turns to ready-made models and methods of word formation, and when borrowing words from other languages, based on them, creates its own.

The sources of formation of terms in the Kazakh language are: 1) Kazakh language, which makes maximum use of the internal capabilities of its lexical structure; 2) Russian language, which gives ready-made terms or offers a way to calculate them; 3) international terms used in the ready-made language form and give freedom of calculation.

In kazakh linguistics, the following ways of forming terms are distinguished. First, the adoption of terminological meanings by words of the Kazakh language, that is, the semantic method. It is productive in: 1) terminologization of native words of the literary language; 2) terminologization of dialects; 3) transition from one language to another. From one terminology system to another. Second, word formation methods, which can be divided into three groups: a) morphological or synthetic method (using affixes); b) syntactic or analytical (joining words, adding); c) abbreviation method (reduction). Third, the method calculus. Fourth, borrowing ready-made terms from other languages.

As an example of the semantic way of forming a term, we can consider the word *жоба* (*жоспар*), which denotes the type, color and shape of the object. Today, it conveys the terminological meaning of the russian word project. Eg.: *Орал қаласының бас жобасына сәйкес жасалған Достық-Дружба алаңына қазақ драма театры, Пушкин музейі мен ескерткіші, Абай және Тоқай ескерткішдері орналасқан»* (Газета «Орал өңірі», 2007.02.07).

2. Affixal derivation of terms

Affixal derivation is one of the most productive ways to create derivatives, including the terminological vocabulary of the Kazakh language, for example, *үнді + лік* (tonality), *жарықты + лық* (brightness), *құй + ма* (drainage), *араластыр + у* (mixing), *айыр + у* (resolution), *дірілдет + кіш* (vibrator), *жалғау + ыш* (commutator), *жап + қыш* (shutter), *кеңейт + кіш* (expander), *тербелі + с* (swing), *санау + ыш* (counter), *ұшқынбас + қыш* (spark arrester).

Affixes that participate in the formation of terms are not limited to joining only the vocabulary of the national language, but can also join international words, borrowed words introduced through the Russian language. Given example: *автомат + тандыру* (automatization), *индустрия + ландыру* (industrialization), *зонд + тау* (sensing), *детектор + лау* (detection), *индуктив + тік* (inductance), *оқу жоспарының траектория + сының қалыптасуы* (creating a learning path); *кредит + тік технология бойынша* (by credit technology). Words that have passed into Kazakh through Russian retain the properties of international terms (academy, assistant, matrix, mixer, monitor, modem, microphone, laboratory assistant, processor, radar, service, student, timer, telefax, university, focus, expedition, experiment). Here are examples of the use of international terms in physics: *Оқулықта термодинамикалық функциялармен олардың туындылары, фазалық өтулер, төменгі температура термодинамикасы, фазалық кеңістіктегі үлестіру функциялары, ықтималдылық және флукуация теориялары, Больцманның кинетикалық теңдері, Бозе-Энштейннің, Ферми-Дирактың кванттқ статистика, сәулелену статистикасы, тасымалдау құбылыстары талқыланған* and so on.

Let's consider several types of forming models of term formation in the Kazakh language using suffixes. The first group of words consist of terms formed by joining the root morpheme of the kazakh word suffixes *-шы*, *-ші* (*іздену* + *ші* – researcher, *есеп* + *ші* – accountant, *шапшырату* + *шы* – scatterer, *теміржол* + *шы* – railway worker).

The second group includes terms formed by attaching these suffixes to borrowed words: (*бетон* + *шы*, *архив* + *шы*, *коньки* + *шы*, *экскаватор* + *шы*, *скрипка* + *шы*. Suffixes *-шы-*, *-ші-* can join derived roots, complex words and even phrases: *өнерқәсіп* + *ші*, *өндіру* + *ші* (manufacturer), *негізгі салу* + *шы* (founder), *фототіл* + *ші* (photocorrespondent), *перделеу* + *ші* *бүркеме* (camouflage coating). Without limitation by joining only the native words of the national language, the suffixes *-шы-*, *-ші-* are also attached to borrowed words, contributing to the creation of terminological models. At the same time, when combined with borrowed words with the meaning of a specialty, organizations (*бетоншы*, *жазушы*, *тілші*, *өндіруші*) form other terms with the terminological meaning of the owner of this profession.

A special role in term formation belongs to the suffix *-лық-*, *-лік-*. With this suffix are formed adjectives from relative terms *әскерлік қызмет* (military service), *техникалық жұмысшы* (technical worker), *заңдылық* (legality), *заңсыздық* (lawlessness), *оқулық* (tutorial), *мамандық* (speciality), *орталық* (center).

The suffix *-ма/-ме-*, *-ым/-ім-*, *-м-*, *-ыс/-іс-* are highly productive as terminalrows: *бастырма* (canopy), *қондырма* (superstructure), *мінездеме* (feature), *баспа* (publisher), *басылым* (edition), *сұраныс* (demand), *ұсыныс* (supply), *қондырғы* (installation), *тексеріс* (check), *шағылыс* (reflection), *өлшем* (metering, measurement, size), *орама* (coil), *пішім* (format), *пішімдеу* (formatting).

Affix *-шыл*, (*-шіл*) at first glance, it seems identical to the suffix *-шы-*, *-ші-*, but it is attached only to names and forms name, for example, *бөгеуілден қорғанушылық* (noise immunity), *ұйымшыл* (organized). It is not as active in term formation as the suffix *-шы-* (*-ші-*). The latter is attached to nominal roots and verbal derivatives: *программалаушы құрылғы* (programming device), *символ көрсеткіші* (a character pointer), *кернеу көбейткіші* (voltage multiplier), *сөйлеу синтездегіші* (speech synthesizer), *жаңғырық өлшеуші* (ehospital). The same affix forms names that Express a specialty, specialist profession, or social status. Capable of expressing abstract, the abstract concepts, the suffix *-шы* + *лық*, *-ші* + *лік* in education terms perform a sufficiently active role, for example, *таңдаушылық* (selectivity), *өшулікті тегістеу* (level attenuation).

In terms of terminological properties, the average productive affixes are *-қыш/-кіш*, *-кер/-гер*, *-ма/-ме*, *-на/-не*, *-ыс/-іс*, *-ым/-ім*, *-м*: *бүріккіш* (sprayer), *дән тазалағыш* (grain cleaner), *мұздатқыш* (freezer), *өнертапқыш* (inventor), *атомгер* (atomizer), *амплитудалы жиіліктік сипаттама* (amplitude frequency response), *анодтық жүктеме* (anode load), *шағылыстырушы нысана* (reflecting target), *көрінетін бейне* (visible image), *аэронавигациялық байланыс* (aeronautical communication), *қайтарыым* (recoil), *электр баусым* (electric cord), *істікшелі қосылыс* (plug connection), *ысырма* (gate valve).

Note that affixes that were considered at a certain time unproductive in word formation and inflection, acquire great potential in term formation. Thus, the morphemes морфемы *-дама/-деме*, *-нама/-немее*, *-лас/-лес*, *-дас/-дес*, *-ман/-мен*, qualified as morphemes with limited word-forming properties, became available productive: *аялдама* (stop), *телефондама* (telephony), *хаттама* (protocol), *бейімдеме* (adaptation), *ғарышнама* (cosmology), *сапарнама* (travel), *дәйектеме* (justification), *жүктеме* (load), *аналогтық шама* (analog value), *фототіркеме* (photo-setter), *теңселу амплитудасы* (quality amplitude), *тонтама* (series, cycle), *түсініктеме* (comment).

3. Borrowing as a way to replenish the term system

Let's look at examples of international terms borrowed by the Kazakh language in a ready-made form, in particular, terms in the scientific and technical field. In recent years, the Kazakh language has included terms translated and taken ready-made from other languages: subscriber, battery, block, vacuum, vector, generator, diagram, diaphragm, drainage, probe, impedance, pulse, inversion, interference, Internet, cable, quantum, kinescope, coefficient, computer, laser, location, magnetron, maser, route, matrix, microphone, modulator, monitor, multivibrator, navigation, neurocomputer, password, processor, radar, radio station, walkie-talkie, register, relaxation, selsin, service, signal, station, supervisor, tabulator, telegraph, telex, transposition, transformer, track, triode, phase, phase meter, photogram, phonon, cycle, cipher, gateway, scale, rod, probe, electron, screen, epitaxy etc.

These terms become one of the main semantic concepts of modern Kazakh culture, entering the daily life of specialists, symbolizing modern science. As a result of the mass penetration of such terms into the scientific style of the Kazakh language, the lexical Fund of the modern Kazakh language is expanding.

4. Addition and abbreviation as ways of term production

A great influence on term formation has a syntactic or analytical method of word formation, which mainly uses the combination of two or more words. In the formation of terms, this method allows phrases from commonly used words and

terms. The following main models are distinguished in the term formation in the modern Kazakh language:

- first, when both components forming a term can be non-derived with semantically independent roots: *көзқарас* (worldview), *ұшбұрыш* (triangle), *өнеркәсіп* (industry), *қолтаңба* (autograph), *қолөнер* (craft);

- second, when one of the words is a derived root that allows the formation of lexical units in a morphological way. For example, *сенімхат* (attorney), *өнертапқыш* (the inventor), *онкүндік* (the ten days), *бесжылдық* (five years).

The morphological and syntactic method includes models formed by combining non-derived roots and loanwords: *киножарнама* (kinoafisha), *телехабар* (TV program), *электронсызба* (electronogram); and paired words *орақ-балға* (hammer and sickle), *түрлі-түсті бейне* (color image), *ауыстырып қосқыш* (switch), *сүзгі-тығын* (filter-plug), *құрал-сайман* (tool).

Widely used in the practice of term formation of the Kazakh language and the method of abbreviation. There are several models for using it:

- 1) the use of initial syllables by reducing two or three full-valued words and formed from the first word of the first component and the full form of the second: *совхоз*, *телехабар*, *электронсызба*. This type of reduction, however, did not become productive.

- 2) reduction of the initial syllables of the first word and the initial letters of subsequent syllables: *KazTAG* (Kazakh Telegraph Agency), *KazPI* (Kazakh pedagogical Institute), *KazGU* (Kazakh state University), *WKSU* (West Kazakhstan State University) etc.

- 3) borrowing terms, educated in the Russian language by reducing letters components: the *ЗАГС*, *ДОСААФ*, *ГЭС*, *МАИ* (*Мемлекеттік автоинспекция* – traffic police), *МКҚК* (*Мемлекеттік коммуналдық қазналық кәсіпорын*) etc.

The formation of words in the Kazakh language vocabulary from syllables and initial letters of some components is especially active as a way of forming terms during the rapid development of science and technology. However, it cannot be said that all the terms-words formed in this way correspond to the norms of the Kazakh language and have become common, because there are many words that have not found their specific place in the process of normalization of the Kazakh language and are used in various spellings. Their systematization based on the laws of language, ordering and normalization is one of the tasks of linguists.

Terms: subscription, author, axiom, advance, avangard, autonomy, balance, bank, budget, bulletin, bureau, currency, department, anthem, guard, decree, delegate, deputy, diplomat, dialectic, dissertation, jury, interview, inflation, channel, cash register, quorum, competition, etc., entered the Kazakh language through

Russian, alone retaining its international content, others were formed in the Kazakh language in various ways during the translation process. Most of the terms listed above are perceived as Kazakh words. The list of such terms can be continued. International terms are translated into Kazakh in various ways. Some of them find their correspondences in the Kazakh language, while others are translated or calculated. For the most part, they define the modern Kazakh literary and scientific language, increasing its internal capabilities. As a result of interaction with the Russian language, the potential possibilities of these words were revealed, which greatly expanded the service area of the language.

5. Terms-copies in the Kazakh language. Basic calculation methods

One of the most active ways of mastering Russian terms in the Kazakh language is calculus, which activates certain word-formation models of the language. It is well known that calculus in any language is one of the principles of learning foreign languages. Through contact Russian and Kazakh languages along with the borrowing of terms in the Kazakh language, there are various tracing papers on the model of words of the Russian language, which also replenish and enrich the language. In the linguistic literature, the following methods of calculus are known: semantic, structural, morphemic etc. For example, in the process of forming socio-political and technical terms, the semantic method of calculating is used more actively, i.e. in this case, new words are not formed, and previously existing words acquire a new semantics, not the word itself is calculated, but its meaning, semantics.

By their structure, tracing paper terms can be simple (consisting of one word), complex (consisting of two or more words), and composite (consisting of phrases).

Simple tracing paper: reservoir – *бөген*, sample – *үлгі*, salary – *айлық*, payment – *төлем*, hydrogen (chemical.) – *сутегі*, ignition (tech.) – *тұтандыру*, clip (tech.) – *қысқыш*, invest – *инвестициялау*, liquidity – *өтімділік*, customs officer – *кеденші*, thermal conductivity (Phys.) – *жылу өткізгіштік*, device – *құрылғы*, refrigerator – *тоңызатқыш*, vacuum cleaner – *шаңсорғыш* etc.

Complex tracings: *workday-еңбеккүн*, *world-көзқарас*, *дүниетаным*; mechanized – *мотомеханикаландырған*, genitourinary (med.) – *несеп-жыныстық*, petrochemical production – *мұнай-химия өндірісі*, telecommunications – *телебайланыс*, *телеқатынас*, TV reviewer – *телешолушы*.

Composite tracing: investment – *күрделі салым*, tenant – *пәтер жалдаушы*, flax dryer – *зығыр кептіргіш*, metrostroets – *метрополитен құрылысшысы*, concrete mixer (tech.) – *бетон араластырғыш*, *бетон араластыратын машина*, theorize – *теория мәселелерімен шұғылдану*, *теория жасау*, heat supply –

жылумен қамтамасыз ету, formulate – тұжырымдап айту, research work – ғылыми зерттеу жұмысы.

Russian language is characterized by prefixal word formation, while Kazakh does not have prefixes, so they are calculated or retain the Russian form, which is found in several international terms: **интервокальдық**, **интернационалистік**, **интегралды** (*math., integral*).

The foreign-language root, as the first part of a complex word in Russian, is preserved unchanged in the Kazakh version: aircraft factory – **авиазауыт**, air transportation – **авиатасымал**, airmail – **авиапошта**, civil aviation – **азаматтық авиация**, auto engine – **автоқозғалтқыш**, to automate – **автоматтандыру**, vehicle – **автокөлік**, biocurrents – **биотоктар**, geopolitics – **геосаясат**, geological exploration – **геологиялық барлау**, photo document – **фотоқұжат**, photocopy – **фотокөшірме**, electric drill – **электр бұрғысы**, electric motor – **электр қозғалтқыш**, electric furnace – **электр арқылы балқыту**, **электр қуатымен балқыту**.

Kazakh language borrows a number of international prefixes along with the basics through the Russian language. These include the prefix *inter-* (consonant in meaning and meaning to the Russian prefix *inter-*). When calculating derived terms the equivalent root and word formation are usually selected an affix that can become the equivalent of the root and word-forming affix of another language.

Russian terms with the prefix *inter-* are translated from Russian to Kazakh by means of a postposition – a service word that is devoid of inflection and functionally corresponds to the Russian preposition, but always occupies a postposition. Postpositions are used in Turkic languages, including Kazakh, expressing spatial, temporal, causal and other relationships. The equivalent of the prefix *inter-* in translation is the postposition **ара**, **аралық**. Examples include: international – **ұлтаралық**, interdistrict – **ауданаралық**, intersectoral – **салааралық**, interstate – **мемлекетаралық**, interdepartmental – **ведомствоаралық**, intercellular – **жасуша аралығындағы жасушааралық**, intertribal – **тайпааралық**, interosseous – **сүйекаралық**.

Russian language prefixes such as **пре-**, **на-**, **при-** Kazakh are calculated as follows: *пре-/пред-* using service names of the horizontal plan **алды-**, **кейін-**, **жаны-**; service names of the vertical plan **үсті-**, **асты-**, **беті-**, **төбе-**: **предпраздничный** – **мереке алдындағы**, **предвыборный** – **сайлау алдындағы**, **надводный** – **су үстіндегі**, **наземный** – **жер бетіндегі**, **послевоенный период** – **соғыстан кейінгі кезең**, **привокзальный** – **вокзал жанындағы**, **пришкольный** – **мектеп жанындағы**.

The prefix *counter-(anti-)* is passed in the Kazakh language by the word *karsy* (letters.: against). Give some examples: counterweight (tech.) – **қарсы салмақ, ауырлық**; counteraction – **қарсылық, қарсы әрекет, қарсыәсер**; anti-missile defense – **ракетаға қарсы қорғаныс**, anti-radar coating – **радиолокацияға қарсы бүркемелеу**.

This method of calculating is also carried out with terms and phrases, some of which consist of the international prefix *anti -*, for example: anti-alcohol propaganda – **маскүнемдікке қарсы үгіт, насихат**; anti-war demonstration – **соғысқа қарсы шеру**. A number of terms with the prefix *anti-* with russian suffixes **-ист-, -изм-**: anti-Semitism, antiseptic, anticyclone mastered in the Kazakh language with the preservation of the prefix and suffixes, but with the Kazakh affixation in the form **антипартиялық, антипатриоттық, антисемитизм, антисептикалық, антициклон, юрист, криминалист, журналист, машинист**, that is, borrowed russian-international terms are combined with native kazakh affixes.

Terms with the prefix *ultra-* (ultrashort, ultraviolet) are calculated as follows: the prefix is saved as a word, and the basis of the term is calculated: ultraviolet rays – **ультракүлгін сәулелер**; ultrashort waves – **ультра қысқа толқын**. The terms supersonic car and hypersonic speed, which were actively used in the second half of the 60s, sound the same in the Kazakh language: **дыбыстан тыс** (машина), **дыбыстан тыс** (жылдамдық). Russian terms and phrases have semantic differences hypersonic in comparison with supersonic in the Russian language means a higher degree of quality. Close in value to the prefix before – is the prefix *pre-*, the opposite value expressed by the morpheme *on-or after-*.

For example, pre-revolutionary – post-revolutionary, pre-reform – post-reform are translated into Kazakh as **революцияға дейінгі, революциядан кейінгі реформаға дейінгі** (реформа алдындағы) – **реформадан кейінгі**. In this case, the kazakh equivalents of prefixes are translated by calculating from Russian. As a result, the combination of terms acquires a new meaning that was previously absent in the Kazakh language.

Compound terms are free combinations of words, i.e. phrases. In terminological phrases, each of the components can act as an independent, Express one specific concept. For example, the components of *тас көмір* "coal" (lit.: stone-coal) in a separate operation denote not only objects, but also retain the conceptual content. Therefore, composite terms are similar in their structural and semantic features to word combinations, and they are classified as word combinations or terminological phrases. Terminological phrases are formed in the Kazakh language syntactically.

Calculus of terms formed in a syntactic way is the calculus of Russian terms and phrases. In Russian, terms and phrases are formed in different ways. The following options are available:

- a) "adjective" + "noun";
- b) "noun" + "noun".

Terms of a phrase like "relative adjective + noun" are calculated in two ways:

- a) without a suffix for the phrase "noun + noun": Golden root – *алтын тамыр*, eye medicine – *көз дәрі-дәрмегі*, medicinal plants – *дәрі өсімдіктер*;
- b) the phrase "adjective formed from a noun + noun": the oil solution – *майлы ерітінді*, saline – *тұзды ерітінді*.

Terms and phrases such as "quality adjective + noun" are calculated without change. For example, white sugar – *аққант*, bitter salt – *ащытұз*, high-frequency chip – *жоғары жиілікті фишка*, cross-correlation – *өзара корреляция*.

Terms-phrases, the defining part of which consists of two words, for example, with the component-figurative, - prominent or-similar, are translated into the Kazakh language as follows: the basis, if not translated, is preserved, and if translated – is replaced by the kazakh equivalent. The above components compound words are indicated by the word *тәрізді*. For example, a cone-shaped capsule – *конус тәрізді, капсула*; egg-shaped capsule – *жұмыртқа тәрізді капсула*, crustacea – *шаян тәрізді*.

As you can see, when calculating the first component of a phrase, different suffixes are used to form adjectives from nouns. In terms of phrases such as "noun + noun" (without a preposition), the components change places when calculating: the probability of transition – *өту ықтималдығы*, the movement of ions – *иондар қозғалысы*, clove broth – *қалампыр қайнатпасы*, a decoction of oats – *сулы қайнатпасы*. If one of the components of a phrase is built on the "adjective + noun" type, then it is replaced with the Kazakh term when translated, or it may remain, and the second component remains untranslated, but its ending is thrown out.

There are also such terms and phrases that, as russian-international adjectives, pass into the Kazakh language without grammatical indicators, such as "noun + noun" without any affixes.

For example, acetylsalicylic acid – *ацетилсалицил қышқыл*, carbolic acid – *карбол қышқыл*, nicotinic acid – *никотин қышқыл*, ascorbic acid – *аскорбин қышқыл*. Although it would be correct to formalize the second component in the possessive form of *ацетил қышқылы, карболқышқылы, аскорбин қышқылы*. This corresponds to the data semantics of certain phrases.

Russian-international terms-phrases like "noun + noun" are translated into Kazakh in the same way as terms like "noun + noun". For example, magnesium

sulfate – *магний сульфат*, sodium hydrate – *натрий гидрат*, calcium chloride – *кальций хлорид*. Among the terms there are calcifications of the type "noun + noun + possessive affix *ы, і*". For example, sodium sulfate – *натрий сульфаты*.

We believe that this version of the translation more accurately conveys the value of possessiveness. The following terms and phrases belong to the same series: quinine sulfate – *хинин сульфаты*, sodium bromine – *натрий бромиды*, calcium chloride – *кальций хлориды*.

Incoming into General use technical terms activate the corresponding derivational types, in our case safety design characteristic of Turkic languages, which are invaluable, as accurately convey the semantics of the trace with the Russian language terminology phrases. Of the three types of isafet construction, the second type of isafet is the most used in the terminology of the Kazakh language, i.e. the combination of "noun + noun + possessive affix *ы, і*".

6. Conclusion

So, we have considered the features of technical terms in multi-system languages, knowledge of the structure and semantics of which is an important condition for ensuring the completeness and accuracy of the translation of the information contained in the text.

Cross-language comparison of term systems is important for translation science and practice, since terms are units of linguistic and professional knowledge that ensure the effectiveness of cross-cultural communication.

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