

Derivational Features and Translation Problems of Aviation Terms (On English, Russian and Uzbek Examples)

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Annotation: *The derivational characteristics of aviation terminology are analyzed in this article, along with the primary problems that occur while translating such terms between Uzbek, Russian, and English. It looks at the linguistic processes that go into word creation, such as compounding, borrowing, and affixation, and how these vary between the three languages. The difficulties encountered during translation – such as lexical gaps, semantic changes, and cultural differences – are specifically discussed since they frequently make it more difficult to convey technical meaning. In order to address these problems, the paper uses a comparative method to provide examples and emphasize successful translation techniques like standardization, contextual adaptation, and descriptive translation. The study also stresses the importance of maintaining terminological consistency and being contextually aware in technical translation practices. Ultimately, the article contributes to the advancement of linguistic and translation studies, especially in the field of aviation, by offering valuable insights and practical recommendations for translators and researchers.*

Keywords: *aviation terminology, derivation, technical and descriptive translation, affixation, compounding, standardization, contextual adaptation*

Деривационные особенности и проблемы перевода авиационных терминов (На английских, русских и узбекских примерах)

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Аннотация: *В статье анализируются производные характеристики авиационной терминологии, а также основные проблемы, возникающие при переводе таких терминов между узбекским, русским и английским языками. В ней рассматриваются лингвистические процессы, которые входят в создание слов, такие как словосложение, заимствование и аффиксация, и то, как они различаются между тремя языками. Трудности, возникающие при переводе, такие как лексические пробелы, семантические изменения и культурные различия, обсуждаются специально, поскольку они часто затрудняют передачу технического смысла. Для решения этих проблем в статье используется сравнительный метод для предоставления примеров и подчеркивания успешных методов перевода, таких как стандартизация, контекстуальная адаптация и описательный перевод. В исследовании также*

подчеркивается важность поддержания терминологической согласованности и понимания контекста в практике технического перевода. В конечном счете, статья вносит вклад в развитие лингвистических и переводческих исследований, особенно в области авиации, предлагая ценные идеи и практические рекомендации для переводчиков и исследователей.

Ключевые слова: *авиационная терминология, деривация, технический и описательный перевод, аффиксация, словосложение, стандартизация, контекстная адаптация*

Aviatsiya atamalarining yasalish xususiyatlari va tarjima muammolari (ingliz, rus va o‘zbek tillaridan misollar bo‘yicha)

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Annotatsiya: *Ushbu maqolada aviatsiya terminologiyasining hosilaviy xarakteristikallari hamda bunday atamalarni o‘zbek, rus va ingliz tillariga tarjima qilishda yuzaga keladigan asosiy muammolar tahlil qilinadi. Unda so‘z yasalishida kechadigan qo‘shma, o‘zlashtirish va affiksatsiya kabi til jarayonlari va bu uch tilda qanday farqlanishi ko‘rib chiqiladi. Tarjima paytida duch keladigan qiyinchiliklar, masalan, leksik bo‘shliqlar, semantik o‘zgarishlar va madaniy farqlar - ayniqsa muhokama qilinadi, chunki ular ko‘pincha texnik ma‘noni yetkazishni qiyinlashtiradi. Ushbu muammolarni hal qilish uchun maqola misollar keltirish va standartlashtirish, kontekstga moslashish va tavsifiy tarjima kabi muvaffaqiyatli tarjima usullarini ta‘kidlash uchun qiyosiy usuldan foydalanadi. Tadqiqot shuningdek, terminologik izchillikni saqlash va texnik tarjima amaliyotida kontekstdan xabardor bo‘lish muhimligini ta‘kidlaydi. Bundan tashqari, maqola tarjimonlar va tadqiqotchilar uchun qimmatli tushunchalar va amaliy tavsiyalar berish orqali tilshunoslik va tarjimashunoslik, ayniqsa aviatsiya sohasida taraqqiyotga hissa qo‘shadi.*

Kalit so‘zlar: *aviatsiya terminologiyasi, hosilaviy jarayon (derivatsiya), texnik va tavsifiy tarjima, affiksatsiya, so‘z birikmasi (yoki qo‘shma so‘z yasash), standartlashtirish, kontekstga moslashish.*

Introduction and background: There are numerous significant occasions in Uzbekistan’s history that can determine the country’s present and future. All aspects of our society have undergone significant change, particularly since independence, and they are all growing faster every year. This is crucial because it lays the groundwork for our nation to occupy its proper position in the international community. Aviation is currently one of the industries that significantly contributes to the high degree of development of both Uzbekistan and the rest of the globe. Today, like in many fields, linguistics reflects the advancement of science and technology as well as the growth of each of its subfields. In recent years, significant achievements in all spheres of science, the increasing flow of scientific and technical information pose new theoretical and practical tasks for researchers dealing with the problem of terminology in the spheres. In addition, the development of the aviation industry, like other industries, and the increasing complexity of aviation technology systems are increasing attention to the problem of terminology research in the field of aviation activities. It is no secret that aviation is one of the fastest growing technological sectors, and its effectiveness depends on the professional skills and qualifications of its employees operating within the aviation sector. Therefore, it is important for those who want to build their future in this broad field and those who work in this

field, in addition to having in-depth knowledge and professional skills, to study in detail the language features used in the field and the correct use of the words used in it in the speech process, their semantic aspects, etc. For this, they must, of course, have sufficient theoretical and practical knowledge about the lexical features of all terms and words. New terminology that describe innovative concepts, tools, and procedures are constantly emerging as aviation changes in tandem with technological improvements. For linguists and translators, this dynamic vocabulary offers both opportunities and challenges, especially when working across languages with different grammatical systems and derivational rules. The derivational processes of aviation terminology are examined in this article, along with the typical translation issues that occur when translating aviation terms between Uzbek, Russian, and English.

Methods:

In this scientific article, several methods were used to study in depth the formation features of aviation terms in English, Russian and Uzbek and the problems in the translation process. Qualitative and quantitative analysis methods were used as the main methods. Each method played an important role in studying the linguistic and translation aspects of terms according to its function.

1. Qualitative analysis (Qualitative method):

With the help of this method, the semantic, morphological, stylistic and contextual features of terms related to the aviation field were analyzed. Word formation methods (affixation, composition, abbreviations, borrowings) were studied in depth through examples. The semantic differences of terms in English, Russian and Uzbek, their change of meaning depending on the context, as well as the uncertainties that arise in translation were qualitatively analyzed. This approach helped to identify the causes of translation problems and suggest ways to solve them.

2. Quantitative method:

The article created a corpus of the 100 most commonly used aviation terms in English, Russian and Uzbek. These terms were grouped by their formation methods and the percentage of each formation type was calculated. The frequency of problems encountered in the translation process of terms was also statistically analyzed. This allowed us to determine which types of terms cause the most problems in translation and to focus on their solutions.

3. Comparative linguistic analysis:

With the help of this method, terms with the same meaning in three languages were compared structurally and semantically. Their translation options were compared and their differences were identified. This approach serves to accurately translate terms based on linguistic differences.

4. Elements of corpus linguistics:

The study created a small corpus based on texts taken from Internet resources, aviation documents, official websites of international aviation organizations, and English-Russian-Uzbek dictionaries. Based on this corpus, the contextual use of terms and translation options were studied.

5. Descriptive method:

A descriptive method was used to analyze the linguistic characteristics of terms, their translation problems, and their causes. This method identified the formation model, context, and translational relevance of each term.

Through the combined use of these methods, the scientific and practical foundations of the issues raised in the article were widely covered. The results of the study serve as an important basis for increasing the accuracy of translated texts in the aviation sector, ensuring terminological unity, and effectively organizing the activities of translators.

Results:

Aviation terms in English are largely formed through productive derivational mechanisms such as coinage, compounding, initialism, acronym, derivation, conversion and back formation.

a) The coinage

The information pertaining to the aviation coinage process was discovered as a word and its compound. The justification will be displayed below. Wolfair, Speedbird, and Jetblue. (Baldursson,

2017). Although these phrases are created through a compounding process, airline firms utilize them to identify their brands. The compounding processes for Jetblue, Speedbird, and Wolfair are jet(N)+blue(N), speed(N)+bird(N), and wolf(N)+air(N). In fact, this branding serves as a marketing tool for the airline business.

Delta, Freedom, and Quality .

Although these are base or root words, airline firms utilize them to market their brands. The definitions of the terms Quality(N), Freedom(N), and Delta(N), which were created through coinage, are unrelated to those found in dictionaries.

Tower, Approach, Ground.

These terms can be either root or base, but they are used to identify air traffic controllers according to their roles. Thus, there are three tasks. The three roles of an air traffic controller are approach (managing close aircraft), tower (managing closer aircraft), and ground (managing the runway for aircraft landing and taking off). Pilots in this position refer to the air traffic controller by these three terms when speaking on the radio.

b) Compounding

Compounding is the process by which two or more independent words combine to make a single English word. Twelve compounds are present: Verb + Noun, Verb + Verb, Adjective + Adjective, Noun + Noun, Noun + Verb, Noun + Adjective, Adjective+Verb, Preposition + Noun, Preposition + Verb, Preposition + Adjective, Adjective + Noun, and Preposition + Preposition. Below four types of them which occur mostly in derivation of aviation terms will be presented:

No	Compounding of	Words	Process
1.	Noun+Noun	aircraft	air+craft
2.	Noun+Verb	airborne	air+borne
3.	Verb+Noun	runway	run+way
4.	Preposition+Adjective	inbound	in+bound

a) Noun + Noun= aircraft

The two roots of the word "aircraft" are the noun "air" and a noun "craft" (Zakri & Rusdi, 2018). Since this term was created by joining two distinct words without removing any of the original ones, it indicates that a compounding technique was applied to it.

b) Noun + Verb= airborne

The noun air and the verb carried are the two origins that make up the word airborne.

c) Verb + Noun= runway

The verb run and the noun path are the two roots that make up the word runway.

d) Preposition + Adjective = inbound

The preposition center and the adjective bound are the two roots that make up the term inbound.

c) The initialism

Initialism is the process of turning a word's first letter into a word while still pronouncing it by letter. The findings of this investigation are going to be examined through these examples: IFR, ILS, and VFR (ICAO, 2022).

a) Instrument Flight Rules (IFR).

The aforementioned initialism alludes to the regulations governing airplane operations.

b) Instrument Landing System, or ILS.

The collaboration between the pilot and the air traffic controller, who provide direction during a landing approach, is referred to by this initialism word formation.

c) Visual Flight Rules, or VFR .

The aforementioned initialism refers to the regulations governing airplane operations.

d) Acronym

SIGMET (Significant Meteorological Information). ECAM (Electric Centralized Aircraft Monitor).

An acronym is created when a new term is created from the first letters of a group of words, as in SAS (Scandinavian Airlines). The information above demonstrates how beginning letters are utilized to represent words and transform them into words when spoken. The pronunciations of these acronyms are SAS /sAs/, ECAM /i-kaem/, and SIGMET /sIg-met/. (ICAO, 2022; ISO 704, 2009).

e) Derivation

This is the process of creating new words by altering the meaning or grammatical category of base words (roots) with prefixes or suffixes. Here are a few instances of derivation-based aviation terms:

a) Using prefixation

Pre- (before) + flight is called preflight. Meaning: having to do with the processes or inspections carried out prior to a flight.

Over- (above) + flight is known as overflight. Meaning: a flight, frequently without a landing, over a specific region or nation.

b) Suffixation

The combination of jet +liner. Meaning: a passenger plane powered by jets.

An aviator is someone who pilots an airplane; the word comes from the Latin avis, which means bird, plus the suffix -or.

c) Compound derivation

Airworthiness (compound) -airworthy+ ness. Meaning: an aircraft's suitability for safe flight.

f) Conversion (also called zero derivation)

A word formation process where a word changes its grammatical category without changing its form.

To land (verb) ← land (noun). Meaning: for an aircraft to return to the ground.

To taxi (verb) ← taxi (noun). Meaning: for an aircraft to move on the runway under its own power.

To nose (verb) ← nose (noun). Meaning: for the front part of an aircraft to move or point in a direction.

To wing (verb) ← wing (noun). Used metaphorically in aviation: e.g., "to wing its way to..."

To pilot (verb) ← pilot (noun). Meaning: to operate or fly an aircraft.

g) Back-formation

A process where a new word is formed by removing a real or supposed affix from an existing word.

Examples: "to navigate" (verb) ← "navigation" (noun).

Aviate (verb) ← aviation (noun). Meaning: to fly or operate an aircraft.

Telecommunicate (verb) ← telecommunication (noun). Used in contexts such as aircraft communications.

Co-pilate (rare verb) ← co-pilot (noun). Occasionally used informally to mean assisting in piloting.

The formation of aviation terms in Russian is often based on the word formation laws of the general Russian language, but these terms also exhibit some characteristics specific to the field. The following are the main features of the formation of aviation terms in Russian:

a) Affixal formation. With this method, terms are formed using prefixes and suffixes:

самолётчик – "амолёт" + suffix "-чик" (pilot, aircraft controller). (Kryuchkova, 2015).

b) Compound words (сложные слова). There are many compound words in aviation terminology:

авиамотор – "авиа" + "мотор"

аэродром – "аэро" (air) + "дром" (field, road)

c) Abbreviations. A common feature is the use of abbreviations:

ВПП – взлётно-посадочная полоса (runway).

ИЛ – Ильюшин (based on the surname of the aircraft designer aircraft brand). (Толковый словарь авиационных терминов, 2021).

d) Calque. Terms borrowed from foreign languages enter the Russian language through direct translation or structural adaptation:

чёрный ящик – calque of the English phrase black box (Newmark, 1988).

самонаведения – calque of self-guidance

e) International words (internationalisms). Common terms in the fields of science and technology are also used in Russian without change or with slight phonetic and morphological changes: radar, turbine.

Uzbek, a Turkic language, displays a mix of native derivational elements and borrowed terms, particularly from Russian and English due to historical and geopolitical factors. While some terms are rooted in Uzbek morphology, like *parvoz* (flight) and *uchish* (flying), many aviation terms such as *pilot*, *aviatsiya*, and *dispecher* are direct borrowings. Uzbek derivation tends to use suffixes such as *-chi* (for profession), as in *uchuvchi* (pilot), derived from *uch-*, meaning "to fly" (Yuldasheva, 2020).

a) Loanword Adaptation and Hybridization.

A noticeable feature in Uzbek is hybridization, where borrowed English or Russian aviation terms are adapted to Uzbek phonology and orthography. For example, *aerodrom* becomes *aerodrom* in Uzbek with minor phonetic adjustments, while *navigation* becomes *navigatsiya*. These terms are often adopted without morphological integration, resulting in hybrid vocabulary that may lack derivational transparency for native speakers (Crystal, 2003; Baker, 2018). Such hybridization sometimes leads to ambiguity or confusion, especially when multiple foreign-origin terms exist for the same concept. In professional aviation training and manuals, this inconsistency can cause miscommunication and reduce operational efficiency.

b) Formation through word-forming suffixes

New terms are formed by adding suffixes to existing words in the Uzbek language using this method: *uchuvchi* - the suffix *"-uvchi"* is added to the verb *"uch-*", indicating a person who controls the aircraft. *Uchish moslamasi*, *qo‘nish maydoni* - complex terms expressed by defining words.

c) Formation through compound words

Many aviation terms in the Uzbek language are formed by combining two or more words: *Parvoz yo‘li* - a runway intended for the take-off and landing of aircraft. *Parvoz yo‘nalishi*, *havo kemasi*, *uchuvchilar ekipaji* - terms formed from a combination of synonymous units.

d) Formation through abbreviations

There are also terms created through abbreviations in the aviation field, especially abbreviations borrowed from the Russian language: *VVP* - *"uchish va qo‘nish yo‘lagi"* (Russian ВПП - взлётно-посадочная полоса). Abbreviations such as *ILO*, *Ty-154*, *MiG-29* are used internationally in the same form (Vinay & Darbelnet, 1995).

Translation Problems of Aviation Terms. The translation of aviation terms presents several challenges, particularly due to the highly technical nature of the field. These include: **Lexical Gaps.** Many English aviation terms do not have direct equivalents in Russian or Uzbek. Terms like *runway incursion* or *wake turbulence* often require descriptive translations. For instance, *wake turbulence* is rendered in Russian as *турбулентность следа*, while in Uzbek, a descriptive phrase such as *orqa oqimdagi turbulentslik* is used.

Semantic Shifts. Terms in aviation may acquire extended or specialized meanings in other languages. The English term *drone*, for instance, can refer to both military and commercial unmanned aerial vehicles. In Russian, *дрон* is commonly used, but *беспилотник* remains the official term. In Uzbek, the equivalent *uchuvchisiz uchish apparati* is used in formal contexts, though shorter loan forms are gaining popularity in media.

Syntactic and Morphological Constraints. Unlike English, which permits a high degree of morphological flexibility, Russian and Uzbek impose stricter rules on word order and agreement. For instance, translating airborne radar system requires rearranging the structure into a more syntactically acceptable format in Russian: бортовая радиолокационная система and in Uzbek: havo borti radar tizimi.

Use of Acronyms and Abbreviations. The aviation industry heavily uses acronyms such as ATC (Air Traffic Control), ILS (Instrument Landing System), and VOR (VHF Omnidirectional Range). While some of these acronyms are retained in their original form in Russian and Uzbek, others are translated or replaced by local equivalents. This creates difficulties in ensuring consistency across technical documentation and real-time communication.

Comparative Examples and Case Analysis.

English term	Russian equivalent	Uzbek equivalent	Notes
Black box	Чёрный ящик	Qora quti	Literal translation accepted in all three
Autopilot	Автомат	Avtopilot	Direct loan used across languages
Airspace	Воздушное пространство	Havo fazosi	Literal translations, structurally different
Mayday	Бедствие	Favqulodda yordam chaqiruvi	Descriptive translation in Uzbek
Ground handling	Наземное обслуживание	Yerda xizmat ko'rsatish	Functional equivalence through paraphrasing

Strategies for Successful Translation. Accurate language and knowledge of the technical context are both necessary when translating aviation words. A number of tactics are suggested: -Standardization: Consistency is ensured by the use of standardized glossaries (ICAO, IATA, and national aviation authorities).

-Contextual Adaptation: Use terminology that are functionally equivalent rather than translating words for words.

-Descriptive Translation: Detailed explanations, particularly in training materials, can be helpful when there are vocabulary gaps.

-Education and Glossary Development: Professional translators and engineers might benefit from terminology banks for Uzbek aviation terms.

-Collaborative Translation: Ensuring terminological accuracy during the translation process can be achieved by involving subject-matter specialists.

Discussion and Conclusion

The intricacy and richness of technical language in Uzbek, Russian, and English are demonstrated by the derivational elements of aviation terminology. Maintaining language fluency while maintaining technical accuracy is a twofold problem for translators. To achieve effective translation, one must carefully handle morphological variations, lexical gaps, and semantic nuances. We must adapt our methods for comprehending and communicating aviation's complex multilingual lexicon as it develops further. This article aims to help the continued development of multilingual aviation communication and advance the field of terminological research by identifying derivational patterns and common translation issues..

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