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THE THEORETICAL ASPECTS OF TRANSLATING SCIENTIFIC AND TECHNICAL TERMINOLOGY OF THE COMPUTER INDUSTRY

ТЕОРЕТИЧНІ АСПЕКТИ ПЕРЕКЛАДУ НАУКОВО-ТЕХНІЧНОЇ ТЕРМІНОЛОГІЇ КОМП'ЮТЕРНОЇ ІНДУСТРІЇ

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The focal point of this research is the study of IT-related neologisms that prominently appear in popular scientific literature, identifying them as its primary object of investigation. The subject of the study delves into the unique features and complexities involved in translating these neologisms, with specific reference to examples extracted from such literature. The data set has been meticulously compiled through continuous sampling, drawing relevant neologisms from a variety of pertinent sources to ensure thoroughness and representativeness. The importance of this research is underscored by its ability to contribute significantly to the consolidation and expansion of existing knowledge surrounding the translation of IT-specific terminology. Moreover, it provides a comprehensive examination of the multifaceted challenges that often arise in this specialized area of translation. To this end, the work not only emphasizes the unique characteristics and nuanced intricacies inherent in translating IT-related neologisms but also identifies the principal obstacles translators frequently encounter in this domain. Furthermore, the research evaluates various methods and strategies that can be effectively employed to address these challenges, offering valuable insights to both academicians and practitioners working in the field. As a dynamic and transformative sector, the IT industry is distinguished by its relentless pace of innovation and its profound influence on contemporary life. The constant emergence of groundbreaking technologies, novel products, and pioneering concepts necessitates ongoing translation efforts to bridge linguistic barriers. IT neologisms—comprising newly coined words, terms, and ideas specific to the realm of information technology—pose a formidable challenge for translators due to their recency and their frequent lack of established equivalents in other languages. Even when equivalents are available, they may not fully conform to the linguistic, cultural, or terminological norms of the target language, often leading to potential misinterpretations or inconsistencies within translated texts. The significance of exploring this subject lies in the undeniable relevance of information technology and computer science to modern society, especially given the extraordinary speed at which innovations occur in these fields. In an era defined by technological interconnectedness and the accelerated global transmission of information, accurate and precise linguistic translation serves as an indispensable tool for enabling effective communication between nations, cultures, and linguistic communities. Thus, this area of study holds far-reaching implications for fostering international understanding and collaboration. Within this context, the research further seeks to trace the key developmental milestones in the evolution of scientific thought pertaining to neologism studies. It provides a detailed account of established methods and current practices for translating IT-focused neologisms, emphasizing their application within popular scientific discourse. By doing so, this paper aims to bridge theoretical insights with practical applications, broadening the discourse on how linguistic innovation intersects with the rapid evolution of the technological world.

Key words: translation, translation analysis, neologism, computer discourse, IT.

Дослідження присвячене аналізу неологізмів у сфері інформаційних технологій, які зустрічаються у науково-популярній літературі, з акцентом на їхній переклад. Основним об'єктом уваги є характеристики та особливості перекладу цих нових термінів на основі конкретно відібраних прикладів з відповідної літератури. Набір даних формувалася шляхом систематичного збору неологізмів із релевантних джерел. Цінність цього дослідження полягає у внеску до систематизації наявних знань з перекладу термінології інформаційних технологій. Воно сприяє більш глибокому розумінню проблем і викликів, що постають перед перекладачами, пропонуючи аналіз стратегій і методів, які допомагають ефективно долати ці труднощі. Стаття детально розглядає особливості перекладу IT-неологізмів, виявляє ключові проблеми та обґрунтовує підходи до їх вирішення. У сфері інформаційних технологій постійний розвиток нових технологій, концепцій і продуктів значною мірою впливає на сучасне життя. Ця галузь демонструє одну з найвищих швидкостей виникнення нових термінів і понять, що створює суттєві виклики для перекладачів. IT-неологізми зазвичай є відносно новими явищами без усталених еквівалентів в інших мовах. Навіть за умов наявності таких еквівалентів, вони не завжди відповідають стандартам термінологічного узгодження у мові перекладу, що потенційно може призводити до помилок у розумінні тексту. Актуальність цієї теми зумовлена стрімким прогресом у галузі комп'ютерних наук та інформаційних технологій. За умов глобалізації та все ширшого впровадження технологій правильний лінгвістичний переклад набуває критичної значущості для забезпечення ефективної комунікації між різними культурами та країнами. У статті розкрито основні етапи розвитку наукових підходів до вивчення неологізмів та наведено детальний аналіз існуючих методик перекладу новоутворень у сфері IT у контексті науково-популярного дискурсу.

Ключові слова: переклад, аналіз перекладу, неологізм, комп'ютерний дискурс, інформаційні технології.

Problem statement. The terminology associated with computers represents a notably intricate aspect of computer discourse, distinguished by its distinctive patterns of vocabulary, syntax, and semantic framework. These specialized terms form the foundational elements of the technological and computing landscape. They are instrumental for professionals across various domains, including engineers, IT specialists, journalists, web developers, and other individuals engaged in scientific and technical fields. However, their influence extends well beyond these spheres. In order to achieve an accurate and contextually appropriate translation of texts within the realm of computer discourse, a translator must possess a comprehensive understanding of the unique characteristics of computer-related terminology. Additionally, they need to be familiar with various approaches for accurately adapting these terms into the Ukrainian language, ensuring precision and consistency in communication.

The **purpose** of this work is to explore the specific features involved in translating scientific and technical terminology from English into Ukrainian and to identify potential challenges that may emerge during the translation process. To achieve this **goal**, the following tasks need to be addressed:

1. Examine the theoretical framework relevant to the topic of this study.

2. Analyze the English-language key terms and newly coined words that require translation into Ukrainian among scientific and technical terms of the computer industry.

The **subject** of this research is scientific and technical terms of the computer industry found in online sources.

The study examines the specific aspects involved in translating these terms, drawing from examples within dictionaries, scientific and technical articles, internet publications, instructions texts as **an object**.

Presentation of the main research material. Scientific terminology represents one of the pinnacle achievements of human intellectual effort, embodying the progress made in science and technology. Since terminologies are fundamentally built on words originating from different national languages, it is no surprise that scientific and technical texts prominently serve as a crucial domain for linguistic terminology [7, p. 1]. The key characteristics of a technical or scientific style include objectivity, precision, and logical coherence, reflecting a clear connection between the central theme and its details. From a grammatical perspective, technical and scientific texts often feature participial, infinitive, and gerundive constructions. While these structures add depth and textual

precision, they can also pose challenges for readers in fully grasping the intended message or primary ideas. It is common practice for experts across different nationalities to apply diverse methods and theoretical approaches in the field of terminology, also referred to as terminology science. Since terminology is context-specific, a single term can carry distinct meanings in various fields. For instance, the word "mouse" conveys different concepts based on the domain in which it is used. Effective terminology management requires each term within a specific domain to correspond to only one concept, avoiding ambiguity or overlap [6, p. 5].

Scientific and technical texts are notably characterized by a significant presence of terms, with about 25% of their content being terminological. These terms can be categorized as general scientific, general technical, or colloquial vocabulary [11, p. 185]. Consequently, the vocabulary in such texts is typically divided into terminological and non-terminological categories. However, this classification is somewhat conditional, as the continuous creation of new terms and the polysemy of words allow them to function across multiple domains, contributing to the dynamic expansion of the language's lexicon.

To illustrate, every language exhibits instances where the same word carries different meanings, reflecting its own interpretation. For example, the term "valve" can denote a lamp, a crane, an engine component, or instrumentation. In other contexts, it may signify a storage unit, warehouse, or accumulation. Similarly, the term "frame" might refer to a structural element in devices, machine tools, or construction [2, p. 1]. These examples demonstrate that certain areas of terminology can be applied across various domains, often revealing their polysemic nature [11, p. 185].

As a result, we shifted our focus to the translation of these sciences, acknowledging that scientific and technical translations convey distinct meanings. Scientific and technical translation can be defined as a practical activity that involves the thorough and systematic analysis of the physical and natural world through experimentation and observation. Byrne offers an in-depth explanation of the distinction between science and technology in the context of translation. He highlights that technical translation pertains to the practical application of scientific knowledge, while scientific translation deals with pure science, encompassing its theoretical, complex, and introspective aspects. Building on this perspective, and using Pinchuk's classification as a framework, Byrne identified three fundamental categories of this definition: the outcomes of basic or pure sci-

ence, the results of applied scientific research aimed at addressing specific issues, and the work of technologists focused on developing commercially viable industrial products or processes [4, p. 185].

It is crucial to comprehend and, even more importantly, effectively translate these types of texts, as translating scientific and technical materials demands a high level of precision from the translator. Therefore, the primary focus of the project is to ensure quick delivery of translations without compromising on quality. However, this process presents one of the key challenges in this field, as technical and scientific translations often require extensive knowledge across various areas of study or specialized topics [10, p. 36]. Technical translation refers to a specialized form of translation focused on converting documents created by technical writers, such as owner's manuals, user guides, and similar materials, or texts connected to technological subjects and the practical use of scientific and technological knowledge [9, p. 1]. However, simply relying on terminology is insufficient to categorize these texts as technical. It is also essential to evaluate the methods used in translation and approach the field with a comprehensive understanding, considering not just the terminological aspect but its broader nuances.

Persisting with technical translation parsing, the technical translation itself is more problematic because the rate of enhancement of translation is fast-paced and therefore demands new definitions over existing terms, which for translators is nothing but a challenge. In this case, the researchers and translators provide a documentary process of some features in this field that, in turn, guarantees the definition of appropriate terms for the target culture. The cooperation between fields of translation in progressive discourse plays a meaningful role; they feed all and sundry with the new terms and designations that help to build up both vocabulary and polysemy of the words. For example, in communications, translators need to use branch-wise dictionaries and glossaries in telecommunications, radio electronics, microelectronics, computer science, economics and finances, advertising and marketing, and often in mass media, which narrows the zone of using such terms. After all, you need almost the same information sources to translate a guide for car owners [5, p. 8].

Technical translation has evolved significantly, reaching a pivotal phase at the start of a new decade. Its importance has been revitalized not just theoretically, but also practically for translators, who now find it crucial. This is particularly relevant as technical translation accounts for 25% of the translation work

related to general scientific, technical, and commonly used terminology. This prominence has led to further research in the field. However, technical translation is not without its flaws. Many of these imperfections are not immediately obvious and often arise throughout the translation process among translators. They result from disagreements over context, meaning, and definition, collectively referred to as "internal" issues. These challenges stem from the continuous evolution and development of language during translation.

Translators often establish their own frameworks and definitions, adding complexity to the translation process. These challenges reflect the different stages of translation development and are influenced by external factors that translators may not control. The intricacies of technical translation can include various professional and technical hurdles. Translators often need to draw on knowledge from other fields, like technical communication and psychology, to grasp the full meaning of a translation. Moving forward, understanding the complexity of technical translation involves recognizing both internal and external factors, each influencing the translator's final output.

This area of study proves to be particularly complex due to the external challenges outweighing the internal ones, which are more critical in the realm of translation theory [9, p. 5]. A prime example is the influence of the Internet—a remarkably powerful technological tool that has fundamentally altered the nature of texts. In today's era, texts are judged in their original languages rather than through translations. This shift demands that translators adopt a more creative and informed approach, placing them in a challenging position. As a result, there is a noticeable merging of technical translation and technical writing, which poses significant issues for traditional translation studies. It appears that most of these difficulties arise from a lack of precise definitions and the theoretical framework's inability to establish them clearly. The various external constraints—shaped by technological advancements, legal regulations, and professional expectations—necessitate a reassessment of the role of technical translators and what can reasonably be expected of them [3, p. 5]. As these challenges continue to grow, they inevitably extend their impact to educators and researchers in both technical translation and related fields.

Scientific translation refers to the process of translating terminology within various scientific fields, such as medicine, physics, chemistry, and computer science. While technical translation covers a broader range, scientific translation focuses more narrowly on specialized areas like law, medicine, and chemistry. This form of translation becomes

particularly significant as global advancements lead to the creation of new terms and associated challenges. Although scientific and technical translations are distinct in nature, they share certain techniques for handling terminology, a point that scientists often need to address. Key characteristics of scientific and technical texts include a high density of specialized terminology and terminological collocations. These terms convey concepts that have been rigorously defined and are exclusive to specific domains within science and technology.

Scientific and technical terms, as linguistic signs symbolizing concepts within specialized professional domains of science or technology, represent significant challenges in translation. These challenges often arise from the absence of equivalent terms, issues of ambiguity, or cultural and linguistic specificity. A notable complexity is polysemy—the phenomenon where a single word can possess multiple meanings. In scientific and technical terminology, polysemy frequently manifests as semantic word formation, meaning one term may correspond to several interpretations depending on the context. For instance, certain terms might be applicable across various fields, making context the essential tool for accurate translation. Within a specific context, such scenarios pose noteworthy difficulties for translators; hence, understanding terms—especially new ones or neologisms—requires the translator to thoroughly analyze the project and correctly convey both its terminology and scientific concepts. Among lexical challenges, there is a category known as "false friends of a translator." These are groups of international words that can appear similar in sound but differ significantly in semantics and stylistic nuances, which are uniquely inherent to each language. [8, p. 39]. Missteps in handling such terms can result in errors, leading to misinterpretation of foreign-language information and ultimately diverting the reader or translator from the text's intended meaning. Ignoring context only exacerbates these translation issues, whereas careful consideration of contextual clues resolves ambiguities and ensures precise interpretation of terms.

Furthermore, while lexical discrepancies, such as specialized terminology or specific vocabulary, tend to stand out more visibly in text, grammatical

differences present additional challenges. Complex and compound sentence structures often vary across languages due to differing syntactic systems. These variations in grammar can create substantial hurdles from a structural point of view, requiring translators to navigate these linguistic disparities with care to preserve the accuracy and intent of the original material [11, p. 185].

Results. In the theoretical section, we analyzed the structure of scientific and technical texts within the realm of computer discourse and examined computing terminology, which occupies a significant role in the linguistic system. This terminology is fundamental to both the system of terms and word formation processes. A term is defined as a linguistic unit representing a concept within a conceptual framework. It is a distinctive feature of discourse and can manifest as a noun, verb, adjective, or adverb. Most linguists classify terms into two main sub-categories: general terms and specialized terms. Scientific and technical terminology encapsulates the concepts driving computing development while expanding the vocabulary through the introduction of new terms. One notable characteristic of such terminology is its systematic nature, including the presence of precise definitions, lack of emotional expression, and stylistic neutrality. Through our research, we identified that a computer-related vocabulary system can emerge from terms derived from common language, general terms with broad definitions, specialized computing terms, and terms with multiple meanings. Additionally, an intriguing feature of computer terminology lies in its methods of creation, which include classification, quantitative approaches, comparative analysis, systematization, statistical examination, and descriptive strategies. The formation of computer terms occurs through several methods: morphological processes (such as affixation, abbreviations, and acronyms), syntactic approaches (like creating terminological phrases), and combinations of morphological-syntactic techniques. Computer discourse itself refers to the specialized communication within computing science, shaped by the style and context of various texts including user manuals, guides, instructions, academic articles, media publications, and research studies.

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