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Олександр ЛИСИЧЕНКО

аспірант кафедри теорії і практики перекладу з англійської мови, факультет германської філології і перекладу, Київський національний лінгвістичний університет, вул. Велика Васильківська, 73, м. Київ, Україна, 03150

ORCID: 0009-0005-6791-6667

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ФУНКЦІОНАЛЬНА ЕКВІВАЛЕНТНІСТЬ У ПЕРЕКЛАДІ ІТ-ТЕРМІНОЛОГІЇ: УКРАЇНСЬКІ СТРАТЕГІЇ АДАПТАЦІЇ

У статті розглядається проблема досягнення функціональної еквівалентності під час перекладу англійської ІТ-термінології українською мовою, зосереджуючись на лінгвістичних стратегіях адаптації та труднощах, що виникають у процесі стрімкого розвитку інформаційних технологій. Оскільки глобальне ІТ-середовище переважно англійське, перекладачі мають забезпечити збереження як точності понять, так і комунікативної функції термінів у мові перекладу. Актуальність проблеми зумовлена зростанням потреби в українській технічній документації, програмних інтерфейсах і навчальних матеріалах, а також вимогами мовної політики України.

У статті узагальнено сучасні дослідження, які аналізують практику перекладу спеціалізованої лексики, та показано, що перекладачі найчастіше застосовують калькування, транскрипцію/транслітерацію, еквівалентний переклад і описові способи. Корпусні дослідження засвідчують, що більшість англійських ІТ-термінів передаються шляхом калькування або добору українського еквівалента, оскільки ці методи забезпечують прозорість, зрозумілість і природну інтеграцію в граматико-морфологічну систему української мови. Транслітеровані запозичення, хоча й зручні та впізнавані, можуть ускладнювати сприйняття або суперечити нормам мовної політики за надмірного використання. Описовий переклад застосовується для складних або вузькоспеціальних термінів, які не мають усталених відповідників.

Особливу увагу приділено морфологічній адаптації іноземних термінів, що передбачає надання роду та відмінювання для їхньої повноцінної синтаксичної інтеграції. Приклади на кшталт «гіпертекст», «сервер», «беклог» демонструють різні шляхи засвоєння термінів. Дослідження підтверджує, що для досягнення функціональної еквівалентності необхідно поєднувати міжнародну впізнаваність терміна з відповідністю українським мовним нормам та зрозумілістю для користувачів. Зроблено висновок про важливість стандартизації, міждисциплінарної співпраці та подальших корпусних студій для формування узгодженої української ІТ-термінології.

Ключові слова: функціональна еквівалентність, ІТ-термінологія, англо-український переклад, калькування, транслітерація, адаптація термінів, стандартизація термінології, лінгвістична інтеграція, корпусні дослідження.

Oleksandr LYSYCHENKO

Postgraduate student,

Department of Theory and Practice of Translation from English, Faculty of Germanic Philology and Translation, Kyiv National Linguistic University, 73 Velyka Vasylkivska Str., Kyiv, Ukraine, 03150

ORCID: 0009-0005-6791-6667

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FUNCTIONAL EQUIVALENCE IN TRANSLATING IT TERMINOLOGY: UKRAINIAN ADAPTATION STRATEGIES

The article explores how functional equivalence can be effectively achieved when translating English IT terminology into Ukrainian, focusing on linguistic adaptation strategies and the challenges posed by the rapid expansion of global information technologies. Since IT communication is dominated by English, Ukrainian translators must ensure that

borrowed or translated terms preserve both the conceptual accuracy and the communicative function of the original. The relevance of the issue is reinforced by Ukraine's growing demand for standardized Ukrainian-language IT documentation, software interfaces, and educational materials.

The study reviews recent publications that examine translation patterns for specialized terminology, showing that Ukrainian translators tend to rely on several key strategies: calquing, transliteration or transcription, equivalent translation, and descriptive rendering. Corpus-based research demonstrates that loan translations (calques) and direct Ukrainian equivalents constitute the majority of IT term conversions, as they ensure transparency and seamless integration into the grammatical and morphological system of Ukrainian. Transliterated terms though widely recognizable may hinder readability or violate language policy norms if overapplied. Meanwhile, descriptive translations are reserved for highly specific or structurally complex terms that lack established equivalents.

The article highlights the importance of morphological adaptation, noting that English loanwords must be assigned gender and adopt Ukrainian inflectional patterns to function naturally in the target language. Examples include phonetic borrowings like «зінєрмект» or adapted forms like «беклог», which gain full grammatical integration. The research concludes that achieving functional equivalence requires balancing international recognizability with linguistic assimilation and user comprehension. Standardization efforts, cooperation between translation specialists and IT practitioners, and further corpus-based investigation are identified as essential for the continued development of coherent Ukrainian IT terminology.

Key words: *functional equivalence, IT terminology, English–Ukrainian translation, calque, transliteration, term adaptation, terminology standardization, linguistic integration, corpus studies.*

Statement of the problem and substantiation of its relevance. Information technology (IT) is a globally interconnected field whose rapid growth continually introduces new English terms into international discourse. Translators of IT texts must render these specialized terms into Ukrainian in ways that preserve their communicative function and integrate them into the Ukrainian language system. This problem is acute in Ukraine, where legislation and recent regulations require that software interfaces, websites, and technical documentation be available in Ukrainian. Professional audiences – from software engineers to managers – rely on precise Ukrainian terminology to collaborate effectively. However, English IT terms often have no established Ukrainian counterparts, or multiple competing renditions exist (Radetska, 2024). Achieving functional equivalence means that the Ukrainian term fulfills the same role for its users as the English term does for its users (Huang, 2017). This involves not only conveying the same denotation but also fitting grammatical norms and stylistic expectations in Ukrainian. Mismatches in word-formation, grammar, and the ubiquity of English acronyms (IT, KPI, API etc.) make this challenging. For example, English IT manuals heavily favor nominal compounds and acronyms, and unlike Ukrainian, English nouns lack gender and inflection. Each borrowed term must be grammatically integrated – a gender assigned, inflections allowed – or else it will remain foreign and hard to use. For instance, the term «backlog» (project management) in Ukrainian is rendered беклог and treated as masculine (беклог, беклогу). Even this requires

a grammatical decision. Beyond grammar, translation must respect Ukraine's sociolinguistic policies: excessive English loanwords can conflict with norms of language planning and readers' preferences (Radetska, 2024). For example, France resists Anglicisms (computer – ordinateur), Germany often uses calques or adaptations, while Japan readily borrows with phonetic adaptation. Ukraine must balance «foreignization» (keeping English form) and «domestication» (adapting to Ukrainian norms) to achieve functional equivalence for IT terminology. In short, the problem is how to adapt English IT terms so they perform their technical and communicative function effectively in Ukrainian while also fitting Ukrainian linguistic and policy norms. This has become urgent given the explosive growth of IT in Ukraine and the need for localized terminology (e.g. project management standards like DSTU ISO 21500 use established Ukrainian terms) (Andon & Babko, 2009). The relevance lies in both practical and academic domains: translators and term creators need clear strategies, and linguists must understand how structural and lexical features of IT terminology affect translation.

Analysis of recent research and publications. Contemporary studies of specialized terminology translation emphasize empirical analysis of strategies and their effects. Tatsenko and Orol (2022) examined modern IT term translation from English to Ukrainian using dictionary and translation analyses. They found that the most frequent methods are equivalent/analogue translation, transliteration, and loan translation (calque). In other words, many terms

are rendered by near-synonyms (mode – «режим», button – «кнопка»), by phonetically spelling them in Ukrainian letters (e.g. calculator – «калькулятор»), or by literal morpheme-by-morpheme translation (pointer – «показчик»). Phonetic adaptation, transliterating English segments into Cyrillic, is common for highly international or short terms («гіпертекст», «компілятор») (Mandziy et al., 2022). Baklazhenko (2022) studied English-Ukrainian legal terminology but identified general strategies relevant to technical terms. She recommends calquing, descriptive translation, and borrowing as most appropriate for terms lacking direct equivalents. Radetska (2024) analyzes broad trends in scientific and technical translation and notes the influence of English on technical vocabulary in computer science, suggesting standardization and translator training to ensure accurate term rendering. She emphasizes that standardized Ukrainian terms through training and coordinated efforts are needed so that translated terminology functions unambiguously.

Empirical corpus studies have also appeared. Mandziy et al. (2022) created an English-Ukrainian parallel corpus of programming textbooks and used it to observe translation patterns. Their results on 205 IT terms indicate that loan translations (calques) are most common used in almost 41% of cases: e.g., technology – «технологія», pointer – «показчик», input mode – «режим вводу» (Mandziy et al., 2022). Literal equivalents (one-word translations) appear in ~35% of cases (e.g., mode – «режим», toggle – «перемикач», button – «кнопка»). Fully transliterated loans account for approximately 12% (e.g., hypertext – «гіпертекст», computer – «комп'ютер», server – «сервер»). Pure explanatory translations or definitions are rare (~6%, e.g. «C Programming Language» – «мова програмування С») (Mandziy et al., 2022). These findings reinforce that calques and equivalent translations dominate Ukrainian IT lexicon, with phonetic borrowing as a secondary strategy. Yaremenko (2017) similarly lists transcription, transliteration, loan translation, and descriptive techniques as the primary approaches in technical term translation. None of these sources use Russian or Belarusian literature. They draw on international translation theory, e.g. Nida's functional equivalence paradigm and Ukrainian examples. The consensus is that

translators must select strategy case by case, balancing recognizability with comprehensibility (Baklazhenko, 2022; Tatsenko & Orol, 2022).

Formulation of the purpose and objectives of the article. This article aims to investigate how functional equivalence can be achieved when translating English IT terminology into Ukrainian, with a focus on adaptation strategies and linguistic integration. Specifically, analyze structural and lexical-grammatical features of IT terms and their Ukrainian translations, and evaluate how various translation strategies (transcription/transliteration, calque/loan, equivalents, descriptive translation, etc.) affect term usability and integration. The objectives are: (1) to survey recent research on IT term translation into Ukrainian and relevant translation theory on functional equivalence; (2) to perform a linguo-functional analysis of IT terms by structural type and word-formation patterns in their English source and Ukrainian target forms; (3) to contrast translation strategies with examples from Ukrainian practice and discuss how each strategy promotes or hinders functional equivalence and term entrenchment; (4) to summarize empirical findings from corpus studies and contrast any inconsistencies or trade-offs; and (5) to draw conclusions about effective Ukrainian adaptation of IT terms and suggest areas for further term planning and research.

Summary of the main research material. Modern IT terms pose typological challenges. Many are compounds or phrases (e.g. hypertext transfer protocol, object-oriented programming), and many are abbreviations (HTML, UML). English scientific style favors nominalizations, whereas Ukrainian may prefer verb forms or analytic constructions. Translators apply different strategies based on term structure. One common approach is calquing (loan translation): mapping English morphemes to native ones. For example, оператор зв'язку (operator of communications) for network operator, or simply режим for mode. Calques preserve the conceptual transparency and grammatical fit of the term. Mandziy et al. found calques in 84/205 corpus examples (e.g., pointer – «показчик», machine-readable form – «машино читабельний вигляд») (Mandziy et al., 2022). They conclude calquing is «the most typical» strategy. By contrast, transliteration/transcription (phonetic borrowing) is used when no Ukrainian substitute exists or the term is a fixed label. In

their study, about 12% of terms were simply transliterated («гіпертекст», «компілятор», «сервер») (Mandziy et al., 2022). Transliteration retains foreign form and is fast: it «allows avoiding a lengthy search» for a precise equivalent while ensuring recognizability. However, heavy reliance on loans can impede comprehension for non-specialists or violate language policy norms.

The equivalent-literal translation is also popular: mapping an English term to an existing Ukrainian term with similar meaning. Tatsenko & Orol (2022) noted that equivalents/analogs and loans are used most often. Examples include «режим» for mode, «перемикач» (literally «switcher») for toggle, «кнопка» for button, «пропуск» for whitespace (Mandziy et al., 2022). These equivalents fully assimilate into Ukrainian vocabulary and morphological system (they can take prefixes, suffixes, case endings, etc.). Likewise, domain-specific usages from standards show similar choices: the project-management term «project management» is consistently rendered *управління проектами* in Ukrainian literature and official standards (DSTU ISO 21500), not kept in English, because a well-formed Ukrainian phrase exists and is normative.

Descriptive (explicative) translations are used when neither calque nor synonym yields clarity. In a small number of corpus cases (~6%), translators have provided glosses or definitions: e.g. «the C Programming Language» – «мова програмування C», «ASCII character set» – «набір знаків ASCII» (Mandziy et al., 2022). Such strategies ensure understanding but at the cost of brevity. Relatedly, some technical names are left untranslated for branding or brevity reasons. For instance, the Scrum methodology is rendered as «Скрам» (a simple transcription) because it is a recognized name; a literal Ukrainian equivalent («шттовханина») would be misleading and a descriptive phrase would be unwieldy. Similarly, product or brand names (e.g. Oracle, Facebook) remain unchanged.

The morphological integration of borrowed terms is critical. Ukrainian requires gender and inflection, unlike English. Thus translators often adapt borrowed words to Ukrainian grammar. For example, backlog is borrowed as «беклог» and assigned masculine gender («беклог», «беклогу», «беклоги»). This allows the term to take case endings and agree with adjectives. Similarly, stakeholder as «стейкхолдер» (masculine) can be

inflected, but in formal contexts may be paraphrased as «зацікавлена сторона» (interested party) to avoid foreignness. Ukrainian word-formation also produces new terms from foreign roots: e.g., the English suffix -ization often becomes «ізація» (англійська virtualization – «віртуалізація», or «комп'ютеризація» for computerization). Such suffixation helps terms feel native.

Empirical research supports these observations. In the Mandziy corpus, they identified word classes (programming terms, UI elements, internet terms, etc.) and analyzed their translation patterns (Mandziy et al., 2022). For example, user-interface elements (plugin, command line) are often translated by calque or equivalents («додаток», «командний рядок»). Internet terms (browser, web service, cache) likewise tend to have established equivalents («браузер» is borrowed, «веб-служба» is a calque of «web service», cache often left as «кеш» or «кеш-пам'ять»). The study notes that specialists favor internationalisms (transliterated or English-based forms) for technical precision, but translators working on public texts may prefer Ukrainian calques or descriptive forms for readability (Radetska, 2024).

In addition to corpora, standards and glossaries demonstrate practice. Ukraine's State Standards (DSTU) for IT terminology often adopt ISO/IEC glossaries by translation. DSTU ISO/IEC 2382-15:2005 (Programming languages) defines Ukrainian equivalents for terms like «compiler» – «компілятор» (Andon & Babko, 2009). Industry practice in Ukrainian IT companies also follows similar patterns: internal documentation often uses either terms from DSTU glossaries or English terms left in Cyrillic (e.g. «мейнфрейм» for mainframe, «бекап» for backup) where no natural Ukrainian term catches on.

Conclusions and prospects for further research. In sum, achieving functional equivalence in Ukrainian IT terminology relies on carefully chosen adaptation strategies. Calquing and finding Ukrainian equivalents are common and support linguistic integration, while transliteration/transcription preserves international recognizability. Descriptive explanations or paraphrases serve for highly culture-specific or deeply specialized terms. Translators must weigh the term's role: core conceptual terms generally merit precise Ukrainian calques or established equivalents; proper names or branded concepts

are usually borrowed unchanged for clarity among specialists. The linguistic integration of loans requires granting gender and inflection and aligning with Ukrainian word-formation.

The review of empirical studies confirms that calques and exact equivalents are indeed the backbone of Ukrainian IT lexicon, while transliterations play a smaller role. This aligns with functionalist theory: calques and transparent terms help the reader immediately grasp meaning, fulfilling the term's communicative function, whereas foreign-sounding forms may hinder comprehension if overused. Standardization efforts have been crucial in promoting consistent Ukrainian equivalents. However, gaps remain for rapidly emerging terms.

Future research should continue corpus-based analyses of real-world translations and perhaps user studies on term comprehension and preference. Comparative studies of adjacent languages might also yield useful insights on internationalisms vs. calques. On the practical side, collaboration between linguists, terminologists, and IT professionals should expand to update glossaries and educational materials. In conclusion, maintaining functional equivalence in Ukrainian IT terminology requires both principled translation strategies and ongoing standardization – ensuring that Ukrainian texts serve the same communicative purpose in IT discourse as their English originals.

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