Translation of Information Technology Terminology: Linguistic Characteristics and Strategies

Ungalova Dilnoza Mirzohid qizi
Samarqand davlat chet tillar instituti magistri

Abstract. *Information technology (IT) has generated a rapidly evolving terminology that poses unique challenges for translation. This article examines the linguistic characteristics of IT terminology and the strategies employed to translate IT terms across languages. Drawing on comparative analysis of English IT terms and their counterparts in languages like Uzbek, Russian, Spanish, Arabic, and others, the study classifies IT terms by structure and formation, and evaluates translation approaches such as direct borrowing, calque formation, and semantic adaptation. The results highlight the predominance of English as a source of IT vocabulary, with many languages borrowing terms wholesale to maintain international consistency. At the same time, language-specific efforts at localization (e.g. coining native terms or loan translations) demonstrate the tension between global uniformity and local linguistic identity. A notable finding is the ubiquity of abbreviations and acronyms in IT and their preservation in translation. The discussion situates these findings within translation theory, considering foreignizing vs. domesticating strategies, and emphasizes the need for terminological standardization to ensure clarity. This study contributes to translation studies and linguistics by detailing how IT terminology is managed across languages and what this implies for translators and terminology planners.*

Key words: *IT terminology, translation, borrowing, calque, abbreviation, localization.*

INTRODUCTION. The rapid expansion of information technology has led to the creation of a vast specialized vocabulary (terminology) that spans hardware, software, networking, and other domains. In translation studies, such terminology is recognized as a critical challenge due to its novelty, high rate of change, and heavy reliance on source-language conventions. A term, in the context of terminology science, is generally defined as a lexical unit (word or phrase) that denotes a specific concept in a particular field. For example, a technical term has a precise meaning within its domain that may not fully align with general language usage [1, c. 5–15] [3]. Terminology, collectively, refers to the set of terms of a field, and managing this terminology across languages is essential for effective knowledge transfer.

Because English has become the lingua franca of computing and the internet, most IT terms originate in English [9]. This dominance means that translators and terminologists working from English into other languages often face a choice: whether to adopt the English term directly or to create/choose an equivalent in the target language. Both approaches have implications. Direct adoption (a foreignizing strategy, in translation theory terms) preserves international uniformity but may introduce unfamiliar loanwords into the target language. On the other hand, creating a new local term or a calque (a literal translation of the English components) is a domesticating strategy that can enhance immediate comprehension but might fail to gain acceptance if the English term is already widespread. Striking a balance between these strategies is a recurring theme in translation of IT terminology [10] [12].

Another notable characteristic of IT terminology is the prevalence of abbreviations and acronyms. IT discourse is densely populated with shortened forms (from common ones like *CPU* and *HTTP* to innumerable niche acronyms), which poses the question of how to handle these in translation. Often, such acronyms are left unchanged across languages to maintain consistency [14]. For instance, terms like *CPU*, *ATM*, or *IT* are used as-is in many target texts, with perhaps an explanatory note in the local language if needed [14]. This practice can be seen in Uzbek, where one might write "CPU (markaziy protsessor bloki)"– giving the Uzbek expansion of the acronym in parentheses, but still using the original Latin letters for *CPU*. Thus, translation of IT texts frequently involves importing English acronyms directly [14].

In summary, the translation of IT terminology sits at the intersection of linguistics and technology, requiring consideration of consistency, clarity, and the expectations of both specialists and general audiences. This article aims to analyze how IT terms are linguistically structured and how they are handled in translation, drawing on examples and case studies from multiple languages. By doing so, it sheds light on general principles that can guide translators and language planners in dealing with the influx of English IT terminology.

METHODS. This research employs a descriptive and comparative methodology to examine IT terminology and its translation across several languages. The study is based on a synthesis of existing research and examples drawn from English and a range of other languages (including Uzbek, Russian, Spanish, Arabic, among others). First, a classification of IT terms was conducted according to their linguistic structure (e.g. single-word vs. multi-word terms, compounds, abbreviations) and origin (borrowed vs. native-coined). This classification builds on established terminology science principles [1] and insights from prior analyses of computer terminology in various languages [7] [8].

Next, the strategies for rendering these terms in target languages were analyzed by reviewing literature in translation studies and linguistics that document how different languages cope with English IT terminology. Key sources were academic studies and reports on terminology development in specific languages – for example, studies of Spanish ICT terminology [10], research on Arabic IT terminology [2] [12], Russian IT loanwords [8], and Uzbek terminology development [15]. These sources provided data on the proportion of terms adopted vs. translated, as well as on attitudes of language authorities and professionals.

Furthermore, concrete examples of translation solutions were gathered from dictionaries and technical publications. For instance, online resources and glossaries were consulted to verify the usage of certain translations (such as the Uzbek term *bulutli hisoblash* for "cloud computing" [4]). Standardization documents like the IEEE Standard Glossary were also reviewed to understand how terms are officially defined in English [6]. Although this study did not involve a statistical corpus analysis, it synthesizes quantitative findings from prior works (e.g., percentages of term formation methods) and qualitative observations on translation practices.

By combining these approaches, the study ensures a comprehensive view that integrates both the linguistic properties of IT terms and the practical translation choices observed in different linguistic contexts. The results of this analysis are presented in the following section, structured around the major themes of term classification, formation processes, and translation strategies.

RESULTS. **Terminological Characteristics of IT** – IT terminology can be classified by form and formation. In terms of form, IT terms range from simple single-word terms to multi-word phrases. A single-word term (monolexemic term) is often a base word that carries a specific technical meaning beyond its general sense [1, c. 5–15]. However, multi-word terms are extremely common in this domain. Studies have found that multi-word expressions (collocations) outnumber single-word terms by a large margin in modern IT vocabulary [7]. In one analysis, approximately three times as many new IT terms were multi-word combinations rather than single words [7, p. 120–127]. These multi-word terms typically follow a modifier+noun structure (e.g. "random access memory," "wireless local area network"), which makes their meaning relatively transparent by describing the concept through existing words.

Linguistically, IT terminology exhibits a variety of word-formation processes. Among these, **compounding** and **derivation** are notably productive. Many terms are formed by compounding two or more roots (e.g. *database*, *smartphone*, *cloud computing*) [7]. An empirical study reported that about 74% of new IT terms in recent years were formed via compounding or other morphological combinations [7, p. 120–127]. For instance, in English we see noun-noun compounds like *data center*, and compound patterns have been borrowed into other languages as well (Russian *интернет провайдер* – literally "internet provider" – as a noun phrase calqued from English structure) [11, p. 1203–1207]. **Derivation** (affixation) also contributes to the IT lexicon: terms such as *computerize*, *virtualization*, or the suffix *-ware* in *malware* are created by adding prefixes or suffixes to existing stems. This allows generating whole families of related terms. For example, from *compute* we get *computer*, *computing*, *computational*, etc. as needed. Affixation thus adapts general-language words to technical uses (e.g. *virtualize*, *virtualization* from *virtual*).

Another process is the creation of **abbreviations and acronyms**, which is especially prevalent in IT. Acronyms condense lengthy technical names into shorter forms (e.g. *RAM* for Random Access Memory, *SQL* pronounced "sequel" for Structured Query Language). IT professionals commonly use such abbreviations as convenient shorthand. As a result, IT jargon is heavily acronymized; one survey of IT terminology noted that a significant subset of terms consists of abbreviations [14]. For example, terms like *CPU*, *GPU*, *DNS*, and *GUI* are ubiquitous and are understood by specialists without needing the full form spelled out. These abbreviated forms increase the information density of communication among experts but can be opaque to laypersons.

Internationalism vs. Localization – A core finding of this study is the tension between international usage of IT terms and localized equivalents. Because of the historical and continuing dominance of English in computing, a large proportion of IT terminology in other languages is directly borrowed from English [9]. Many languages simply adopt the English term, sometimes adjusting spelling or pronunciation to fit local norms. For example, *internet*, *modem*, *server* are used nearly universally, including in Uzbek (*internet*, *server*) and Russian (*интернет*, *сервер*), with minimal change. Such terms can be considered *internationalisms* – technical terms that appear across numerous languages in similar form [8].

However, not all languages rely solely on borrowing. Some pursue deliberate **localization** of terminology. French is a well-known case: the French Commission générale de terminologie et de néologie has promoted native equivalents (e.g. *courriel* for email, *logiciel* for software). As a result, French IT texts may use terms unfamiliar to English speakers, although in practice many English terms are also used in French. Spanish offers another example: a recent study noted that only about 27.9% of the officially listed ICT terms in the Spanish language are English-derived, since the Royal Spanish Academy has coined or adapted many others [10, p. 398–408]. Nonetheless, even in French or Spanish, the influence of English remains strong in practice – many professionals continue to use English loanwords despite the official recommendations [10]. Arabic provides a vivid case of localization efforts and their complications: different Arabic-speaking countries' academies coined distinct Arabic terms for the same IT concepts, leading to multiple competing words. For instance, Arabic experts created both *ḥāsūb* (based on the English *computer*) and *rattāba* (based on the French *ordinateur*) as words for "computer," reflecting the influence of English vs. French in various regions. This lack of coordination led to a plurality of solutions for the same concept across the Arabic-speaking world. No single Arabic term uniformly replaced the English *computer*, and in contemporary usage the English word is also widely understood [12]. This example underscores that extensive localization can fragment terminology if not standardized across regions [12]. Even languages with relatively smaller speaker populations face similar challenges; for instance, research on Albanian informatics terminology reports persistent difficulties in adopting IT vocabulary [13].

The Uzbek language, like many post-Soviet languages, shows a mixed approach. During the Soviet era, Russian terms (some of which were themselves calques from English) were used, and Uzbek often adopted those. For example, *informatatsionnye tekhnologii* in Russian was calqued as *axborot texnologiyalari* in Uzbek for "information technologies," rather than borrowing an English term [15]. After independence, Uzbekistan has made efforts to develop Uzbek equivalents for IT terms (such as

dasturiy ta'minot for *software*, literally "programmatic support") [15]. At the same time, many English terms simply remain international (e.g. *internet*, *kompyuter*, *printer*). The interplay of global and local preferences is thus a key characteristic of IT terminology development in Uzbek and similar contexts.

Translation Strategies for IT Terms – The choice between borrowing and translating IT terms is a central strategic decision for translators. The research indicates that for many highly specialized or globally standardized terms, translators lean towards **preserving the English term** in the target text [14]. This is especially true for acronyms and product names. For instance, terms like *HTTP*, *FTP*, or *Wi-Fi* usually appear unchanged in translations, because attempting to translate or alter them could cause confusion and would conflict with global norms. In a study of Ukrainian IT translations, it was observed that a great number of terms (especially abbreviations) were carried over unchanged; when clarification was needed, translators added the full form or an explanation in a footnote rather than invent a new term [14, p. 75–81]. This strategy prioritizes consistency with international usage.

Conversely, when a concept can be easily expressed in the target language or when a term has not yet been widely adopted, translators might opt for a **calque** or descriptive translation. For example, *cloud computing* has been translated into Uzbek as *bulutli hisoblash* (literally "cloud-based computing") [4]. This calqued term conveys the meaning using native elements (*bulutli* = cloudy, *hisoblash* = computing) and has appeared in Uzbek IT publications. Similarly, the English term *software* was calqued in Chinese (软体 in Taiwan, literally "soft body") and rendered in Uzbek as *dasturiy ta'minot* ("programmatic support"). In many cases, both the English loanword and a translated equivalent might exist side by side, at least for a period. The pull of the English term can be strong, especially among specialists who are accustomed to English documentation. Often both the calque and the English loan circulate until one wins out.

An intermediary strategy noted in non-Latin script languages is **transcription or transliteration** of the English term, rather than translation. Japanese, for instance, uses katakana script to write *konpyūta* (computer) and *intānetto* (internet). Russian sometimes writes abbreviations like *SQL* in Latin letters, but also has phonetic forms (e.g. *байт* (*bait*) for *byte*). Arabic texts often include English acronyms in Latin letters because translating or transcribing them is impractical. Thus, coexistence of the original form with an explanation in the local language is common in non-Latin scripts. Transliteration preserves pronunciation but may be less transparent in meaning (unless combined with a descriptive gloss). It is frequently used for product names and branding (e.g. *Google* is written as *Гугл* in Russian) but also for technical terms when no translation exists.

Standardization and Clarity – The proliferation of variants and borrowed terms in different languages raises the issue of standardization. Within each language, terminologists and regulators often try to **reduce synonymy** by selecting one term (sometimes one from many competing variants) to be the official term [12]. If multiple terms (a loanword and a native coinage) are competing, official glossaries or standards may endorse one. For example, in French, *courriel* was officially endorsed over *email* for "electronic mail" to avoid mixing languages. In Spanish, the Royal Spanish Academy might list both an Anglicism and a Spanish term but mark one as preferred; however, enforcement of such recommendations is limited. Practitioners might continue using the English terms in everyday work despite the official stance [10]. Still, international standards and resources can help: when clear standards are in place (such as IEEE or ISO terms), translators are more consistent [6]. Conversely, in the absence of standards, translators rely on their own judgment or on prevalent usage, which can lead to inconsistency. Ongoing terminological work – creating centralized term databases and updating dictionaries – is crucial in the IT field to support translators.

Finally, it is important to note that as IT evolves, new terms emerge continuously (e.g. *Internet of Things*, *cryptocurrency*, *deep learning*). The patterns observed across languages suggest that the initial tendency for such neologisms is to use the English term. Only if the concept becomes deeply integrated into local contexts do more localized terms often appear. Even then, the English term frequently remains in parallel use. This underscores the reality that English functions as a *lingua franca* of technology [9], which translators must accommodate. At the same time, the push for linguistic diversity and precision means that translation cannot rely solely on borrowing; each term

must be evaluated in context to decide if a borrowed word, a calque, or an explanatory translation best serves the audience's understanding.

DISCUSSION. The above results highlight a dynamic interplay between **foreignization** and **domestication**, two key paradigms in translation theory. In the realm of IT terminology, foreignization – the retention of the source-language form – is very common (indeed, often necessary) for acronyms, product names, and standardized technical terms. Retaining terms like *USB* or *Wi-Fi* in a translated text can be seen as a foreignizing strategy, as it brings a piece of the source language directly into the target text. The benefit of this approach, as the findings show, is that it preserves technical accuracy and international intelligibility [14]. A network engineer in any country will recognize *TCP/IP* written exactly in that form. The downside, however, is that excessive use of untranslated terms can make the translated text less accessible to readers not already familiar with them, creating a kind of jargon barrier.

Domestication, on the other hand, involves translating the term into more familiar target-language words. The data indicate that this is done selectively – often for didactic purposes or when a concept can be expressed relatively succinctly in the target language. For example, providing *локальная вычислительная сеть* for "local area network" in a Russian text is a domesticating move that aids comprehension for readers who might not know what *LAN* stands for. However, the translator in this case will usually also provide the English abbreviation in parentheses because that acronym is how the concept is known globally. Thus, the translator's task becomes a balance: introduce a domesticating explanation without eliminating the widely-recognized foreign term.

One implication of these practices is the prevalence of a *hybrid discourse* in translated IT texts. Especially in languages like Uzbek or Russian, one finds a mix of native words and embedded English terms. For instance, an Uzbek technical article might read: "kompyuterning *operatsion tizimi* (OS)…," blending an English acronym into a fully Uzbek sentence. This hybridization is a natural outcome of globalization, wherein languages increasingly share technical vocabularies [10] [12]. Some purists worry that uncritical borrowing might stifle the development of the target language's own terminological repertoire. The French and Spanish efforts to replace English terms reflect an ideological stance favoring linguistic purity and self-sufficiency [10].

From the perspective of **translation practice**, the results emphasize the importance of the translator's awareness of usage conventions. A professional IT translator must know, for example, whether *database* is widely used as a loanword in the target language or if there is an official translated term. Translators often consult bilingual terminology banks or online dictionaries for this purpose. In our findings, the use of resources like the Glosbe English–Uzbek dictionary [4] or technical glossaries [6] serves to confirm how a term is being used in context. The existence of an officially recommended term does not guarantee its prevalence; hence, translators may introduce the local term but retain the English term in parallel, at least on first mention. In technical manuals or academic texts, a common solution is to give the local term and the English term together at first occurrence.

The need for **standardization** in terminology is a recurring theme. When multiple translations exist for the same concept, confusion can arise. The Arabic example of two words for "computer" demonstrates how divergent solutions can impede mutual understanding [12]. International collaboration between standards organizations and language institutions can help in selecting preferred terms. Still, as the Spanish case shows, even a clear official policy cannot entirely prevent practitioners from using the English terms [10]. In practice, the translator's role may be to at least introduce the local equivalent, thereby bridging the gap between prescribed terminology and actual usage.

These findings offer a nuanced view of **equivalence** in specialized translation. In IT, equivalence is not always one-to-one; often it involves choosing between carrying a term over or finding an approximate translation. The translator must consider the **skopos** (purpose) of the translation. For a general audience or educational text, domestication and explanation will likely be more prevalent. For an expert audience or international documentation, maintaining English terms can be more

appropriate to ensure precision. In essence, effective translation of IT terminology requires both linguistic competence and domain-specific knowledge.

Culturally, the dominance of English IT terminology can be seen as part of a broader trend of English influence (anglicization). While some fear that extensive borrowing might lead to *domain loss* (where a language fails to develop its own technical vocabulary), our overview shows that many languages are actively engaging in terminology development despite the prevalence of English loans [10] [12]. Translators serve as gatekeepers in this process: their choices either reinforce the loanwords or bolster the use of local terms. As such, translators and terminologists play a crucial part in shaping how the language adapts to new concepts.

CONCLUSION. Translating IT terminology is a balancing act that reflects broader themes in translation theory and sociolinguistics. This study demonstrated that IT terms, which overwhelmingly originate in English, travel across languages through translation and localization processes, often remaining in their original form but sometimes transformed to align with local linguistic norms. The linguistic characteristics of these terms – whether acronyms, compounds, or metaphoric extensions – significantly influence how easily they can be adopted or adapted. Acronyms tend to remain unchanged across languages [14], while descriptive multi-word terms offer more opportunity for localization [7].

A key conclusion is the importance of maintaining **clarity and consistency** in translated IT texts. Given the inherently international nature of information technology, completely avoiding English loanwords is neither practical nor desirable in many cases [9]. However, ensuring comprehension for the target audience often requires translators to provide explanations or translated equivalents alongside borrowed terms. The optimal approach is pragmatic: use the term (loan or local) that is most widely accepted and understood in the target language community, and augment it with clarification when necessary.

For translators and language planners, the ongoing challenge is to stay current with rapid technological developments and evolving usage. New IT concepts will continue to emerge, and the patterns observed in this study – initial borrowing followed by occasional localization – will likely recur. Future research could track specific neologisms to see how they diffuse and whether local equivalents gain traction over time, further illuminating the life cycle of terminology in translation.

In essence, the translation of IT terminology exemplifies the interplay of global and local language dynamics. It requires translators to possess not only bilingual proficiency but also bicultural competence in the "culture" of technology. By understanding both the universal technical lexicon and the local linguistic context, translators ensure that end-users, regardless of language, can access the concepts and tools of the digital age. Effective handling of IT terms in translation thus plays a vital role in making technology communication inclusive and comprehensible worldwide.

REFERENCES

1. Гринев С.В. Введение в терминоведение (Introduction to Terminology Science). – Moscow: MISIS, 1993. – P. 5–15.

2. Al-Athwary A.A.H., Ali H.K. Arabicization via Loan Translation: A Corpus-based Analysis of Neologisms Translated from English into Arabic in IT // Open Cultural Studies. – 2024. – Vol. 8, No. 1. – Art. 20240005. – P. 1–18.

3. Concise Oxford English Dictionary. – 12th ed. – Oxford: Oxford University Press, 2011. – 1696 p. – ISBN 978-0-19-960108-0.

4. English–Uzbek dictionary entry for "cloud computing" – Glosbe. URL: https://glosbe.com/en/uz/cloud%20computing.

5. IEEE Standard Glossary of Software Engineering Terminology. – IEEE Std 610.12-1990. – New York: IEEE, 1990. – P. 1–84.

6. IT Abbreviations & Acronyms: Comprehensive Glossary – GDC IT Solutions. URL: https://gdcitsolutions.com/resources/it-acronyms-abbreviations/.

7. Jaleniauskienė E., Čičelytė V. Insight into the Latest Computer and Internet Terminology // Studies about Languages (Kalbų studijos). – 2011. – No. 19. – P. 120–127.

8. Janulienė A., Andriulaitytė J. On English IT Field Borrowings in Modern Russian // Sustainable Multilingualism. – 2023. – No. 8. – P. 81–100.

9. Karmazina L. Historical Evolution of IT Terminology and Its Further Development // Scientific Journal of Polonia University. – 2023. – Vol. 59, No. 4. – P. 30–35.

10. Kuzmina E.V. English Borrowings in Spanish ICT Terminology: Language Conflicts and Contacts // European Proceedings of Social and Behavioural Sciences. – 2020. – Vol. 93. – P. 398–408.

11. Prashtilova B. Borrowing Terms from English in the Term System of Computer and Information Technologies in Bulgarian and Russian // Proceedings of the 4th Int. Conf. on Contemporary Education, Social Sciences and Humanities (ICCESSH 2019). – Atlantis Press, 2019. – P. 1203–1207.

12. Solimando C. Arabic neologisms in IT terminology: the role of the Academies // Bulletin d'études orientales. – 2017. – Vol. 65. – P. 123–133.

13. Strori E. Linguistic Problems in the Terminological Lexicon of Informatics in the Albanian Language // Proceedings of the 1st International Conference on Contemporary Academic Research (May 17–19, 2023, Konya, Turkey). – Published by All Sciences Proceedings, 2023.

14. Tatsenko N., Orol V. Translation Features of Modern IT Terminology from English into Ukrainian // Philological Treatises. – 2021. – Vol. 13, No. 2. – P. 75–81.

15. Xolmurodova E.X., Smirnova V.Yu. Terms and Terminology in the Uzbek and English Dialects // Innovative Technologica: Methodical Research Journal. – 2022. – Vol. 3, No. 4. – P. 27–32.