STRUCTURAL ANALYSIS OF IT TERMINOLOGY: MORPHOLOGICAL, SEMANTIC AND WORD-FORMATION PROCESSES

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Abstract. *This article examines the structural composition of IT terminology through morphological, semantic, and word-formation analysis. It focuses on how English and Russian IT terms are formed using compounding, affixation, conversion, abbreviations, metaphorical extension, semantic narrowing, and the creation of new international neologisms. The study highlights the dynamic nature of IT vocabulary and its rapid development driven by technological innovation and global digitalization. The findings demonstrate that IT terminology represents one of the most rapidly expanding layers of modern technical language.*

Keywords: *IT terminology, morphological structure, word formation, neologisms, terminological system*

Introduction

Globalization is initially interpreted as the expansion, deepening, and acceleration of worldwide interconnectedness in all spheres of modern social life. Some researchers describe globalization as a social process that eliminates borders, while others emphasize its integrative and homogenizing features that bring the world closer together.   The integration of various cultures, languages, organizations, states, and regions is referred to as 'globalization. The process of globalization connects people around the world for both personal and business purposes. Today's era of globalization creates new opportunities for people to

exchange ideas on a global scale, disseminate scientific findings, share experiences, and engage in mutual communication.

Although the term 'globalization' began to be used in the 1980s, it is generally interpreted as a phenomenon of the postmodern era. In reality, this process has deep historical roots and accelerated in the last quarter of the twentieth century. Like many other spheres of society, the language system has not remained unaffected by globalization, and it is natural that this process will continue in the future. One of the most significant effects of globalization is the widespread diffusion of languages especially English across the world and the growing convergence among them. English is increasingly recognized as a medium of international communication. Today, only about 25 percent of English users worldwide are native speakers; the majority use English independently of its native-speaking communities.

Moreover, language constantly changes in accordance with the needs of its users. Although linguistic transformation typically occurs gradually, technological development has sharply accelerated this process and made such changes immediately noticeable. The influence of technology has been particularly strong in written communication. A number of new words and terms have entered English and become widespread, standing on the verge of being incorporated into Standard English. As a result of technological innovations, communication channels have undergone fundamental changes: new forms of communication have made interaction more convenient, faster, and more concise. Consequently, English has also adapted to these new modes of communication in order to ensure efficiency and immediacy.

By examining both the positive and negative aspects of globalization and technology, this study contributes to broader scholarly debates about the future role of English as a global means of communication

Methods. Three major approaches have played a decisive role in the formation and development of terminology studies: Wüster's traditional theory, Sager's model of the terminology process, and Cabré's communicative conception. Each of these

approaches interprets the nature, function, and scope of terminological units differently.

The classical theory of terminology proposed by the Austrian scholar Eugen Wüster aims to systematize terms, unify them, and link them strictly to scientific concepts. Wüster formulates three fundamental principles of terminology: precision, univocity, and systematicity. According to the principle of precision, a term must be free of metaphorical usage, polysemy, and expressiveness, and it must denote only one clearly defined concept. The principle of univocity requires a one-term–one-concept relationship, meaning that synonymy and variability should be minimized. Systematicity implies that terms must be organized based on logical relations, hierarchies, and paradigmatic connections. Within Wüster's framework, terms are viewed as specialized units that stand apart from the general vocabulary of the language and exist as strictly ordered elements within a specific domain.

Morphological analysis plays a crucial role in examining the structural composition of IT terms, their word-formation mechanisms, and the way they are transferred into Uzbek. Since English functions as the global lingua franca of the technological sphere, new terminology is primarily formed in English and then enters other languages, including Uzbek, through various word-formation models. The four most widespread morphological models of IT terminology affixation, compounding, conversion, and abbreviation each have their own specific characteristics.

Affixation is highly productive in IT terminology. In this process, new terms are created by attaching affixes to a base lexeme. For example, upload → uploader or encode → encoding, where terms evolve from process names into agentive nouns or nouns denoting the process itself. In English, affixes such as -er, -ing, -tion, and -able are commonly used, while in Uzbek these forms are adapted either through transliteration (server, printer, skaner), native word formation (yuklovchi, boshqaruvchi, kodlash), or semantic adaptation (encoding → kodlash).

Compounding, the creation of new terms through the combination of two or more words, is one of the most active word-formation processes in IT terminology.

Terms such as software, database, firewall, chatbot arise from semantically motivated combinations that yield a techn concept in a clear and concise form. In Uzbek, compound-based terms are adapted in three ways: through calquing (firewall → o'␣t devori; database → ma'lumotlar bazasi), transliteration (software, cloud computing), or hybrid adaptation (web application → veb-ilova; file manager → fayl menejer). Compounding allows technical processes and tools to be expressed briefly and precisely.

Conversion is the formation of a new term by changing a word's grammatical category without altering its external form. This model is extremely active in English, where verbs often shift into nouns over time, or vice versa. Examples include to google → Google (noun); to update → update (noun); to access → access (noun). Since Uzbek does not employ conversion as a natural word-formation mechanism, such terms are usually adapted through semantic translation (update → yangilanish; access → kirish huquqi) or affixation (backup → zaxiralash).

Results. The study of the morphological structure of IT terminology shows that terms in this field are formed through several highly productive word-formation models. The analysis identified compounding, affixation, conversion, and abbreviation as the most active morphological types. These models serve to express new technical concepts in a concise, precise, and semantically accurate manner.

Compounded terms constitute the largest share of the corpus. Units such as software, firewall, and database emerge through the semantic and grammatical fusion of two or more independent components. Given the complex systemic nature of the IT domain, such structures offer an effective means of accurately naming technical processes and objects.

Affixation is also a highly productive model, as seen in terms like encoding, downloader, and antivirus, which emerge through derivational affixes that create new functional units. This productivity is attributed to the frequent use of suffixes and prefixes such as -er, -ing, anti-, re-, and de- in English.

Conversion serves as one of the key mechanisms enabling IT terms to appear in compact and versatile forms. For example, the verb to update becomes the noun update, which functions independently as a technical term. Without altering the lexical form, a shift in grammatical category allows for the rapid formation of new IT terminology.

Abbreviations (RAM, CPU, HTML, AI) reflect the global and international character of IT terminology. These units compress information, enhance communicative efficiency, and are frequently encountered in technical discourse. Owing to their standardized international status, abbreviations are used in the same form across many languages.

Corresponding models in Uzbek also play an important role in the adaptation and formation of IT terminology. Terms borrowed through transliteration (server, printer, modem) retain their form while undergoing phonetic and orthographic adaptation. Calquing produces national equivalents through full translation of structural components, as seen in bulutli texnologiya and o'ʻt devori. Native derivational forms such as raqamlashtirish and axborotlashtirish arise from indigenous word-formation mechanisms and contribute significantly to the development of Uzbek IT terminology.

Overall, compounding constitutes the most productive morphological model in the formation of IT terms. Its dominance is linked to its ability to ensure semantic clarity, structural transparency, and logical representation of technical concepts. Although affixation, conversion, and abbreviation also hold important positions, their share remains lower compared to compounded structures. In Uzbek, transliteration and calquing are the most frequently applied adaptation models, while the role of native derivational forms continues to increase in shaping the national terminology system.

Table 1. Morphological Types of English IT Terms

Morphological Model	Examples
Compounding	software, firewall, database, cloud-system
Affixation	encoding, downloader, antivirus
Conversion	to update → update, to access → access

Abbreviations	RAM, CPU, HTML, AI

Table 2. Corresponding Terminological Models in Uzbek

Model Type	Examples	Explanation
Transliteration	server, printer, modem	Phonetic–orthographic adaptation
Calquing	bulutli texnologiya, oʻt devori	Translation of semantic structure
Native derivation	raqamlashtirish, axborotlashtirish	Word formation using Uzbek affixes

The semantic structure of IT terminology, unlike the general lexical–semantic system of the language, consists of specialized units that precisely denote concepts related to technological processes, devices, software, and digital communication. Semantic analysis of these terms reveals their polysemous characteristics, metaphorical bases, and the ways in which they acquire new meanings through semantic extension. The findings show that a considerable portion of IT terms has shifted away from their original meanings in the general language and has adopted new meanings and functions within technical contexts.

Discussion. The study of the structural, semantic, and word-formation features of IT terminology demonstrates that this domain represents one of the most dynamic and multifunctional layers of the modern language system. The analysis shows that IT terms, unlike the static and strictly systematized units described in classical terminology theory, are context-dependent and adaptive elements that evolve in response to technological and communicative needs. This phenomenon is most clearly reflected in Cabré's communicative approach.

While Wüster's classical model conceptualizes the term as a precise, univocal, and rigidly defined technical unit, real IT communication reveals that this theory does not fully account for practical usage. For example, network, cloud, drive, and platform express different meanings across different discourses, exhibiting polysemy and context-sensitive flexibility. Thus, Wüster's principle of "univocity" does not fully operate in the context of IT terminology.

Sager's model of terminology processes, on the other hand, is highly relevant to the IT field, as it clearly outlines the stages through which new terms are created, standardized, normalized, and introduced into international communication. Many

IT terms such as firewall, cloud computing, or blockchain first appear in the professional circle of engineers and IT specialists, are later consolidated in technical and scientific texts, and eventually spread into public discourse and other languages.

Cabré's communicative approach most accurately reflects the true nature of IT terminology. IT terms do not merely denote technical objects; they also describe social processes, business systems, communication platforms, and even socio-psychological phenomena. For this reason, contextual factors such as speech situation, domain experts, communicative purpose, and broader socio-cultural environment play an essential role in shaping terminological meaning. For example, the term cloud refers to technical infrastructure for a programmer, a storage service for an ordinary user, and a business model (SaaS, IaaS) for a corporate context. From the perspective of terminology studies, this phenomenon is explained through contextual variability.

Morphological analysis confirms that compounding is the dominant model in IT terminology. This reflects the systematic, hierarchical, and modular nature of the IT field. Compound units such as software, database, and cloud system provide concise, logical, and accurate representations of complex technical objects. Affixation and conversion, meanwhile, ensure the efficiency, compactness, and universal usability of IT terms. Abbreviations constitute an essential component of global standards, guaranteeing speed and accuracy in IT communication.

Semantic analysis reveals that many IT terms have metaphorical foundations, and that existing conceptual resources of the language are actively employed to name technical phenomena. Terms such as mouse, bug, window, and virus provide strong evidence of the role of cognitive metaphor. This process helps users conceptualize new technologies more easily and perceive technical processes through familiar imagery. The high presence of polysemous units further confirms that IT terminology is context-dependent and partly non-traditional in its semantic structure.

In Uzbek, IT terminology develops along three main pathways: transliteration, calquing, and native derivation. While these models ensure the integration of

national terminology into global IT processes, they also allow the Uzbek language to generate new significates based on its internal linguistic potential. Units such as raqamlashtirish, axborotlashtirish, and bulutli texnologiya indicate an active phase in national lexicographic development.

Conclusion. The conducted research demonstrates that IT terminology represents one of the most dynamic and rapidly evolving layers of the modern language system. An integrative application of Wüster's classical theory, Sager's terminology-process model, and Cabré's communicative approach shows that IT terms function not only as systematized technical units but also as context-dependent, communicatively motivated elements shaped by technological and social change. Morphological analysis confirms the dominance of compounding, alongside productive affixation, conversion, and abbreviations, while in Uzbek the complementary use of transliteration, calquing, and native derivation indicates the emergence of an active, creative national terminological system. Semantic analysis reveals high levels of polysemy, metaphorization, and semantic extension, reflecting the conceptual complexity and cognitive richness of IT discourse.

Overall, the study highlights that IT terminology evolves at the intersection of global digital processes, the international role of English, and the internal linguistic capacities of Uzbek, offering a solid theoretical and practical foundation for future standardization, dictionary development, translation practice, and the improvement of Uzbek-language scientific and technical communication.

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