

LEXICAL-SEMANTIC ANALYSIS OF IT-RELATED TERMINOLOGY IN
THE UZBEK LANGUAGE

Fazliddinova Gunesh

Teacher, Department of English Philology

Faculty of Pedagogy, Social Sciences and Humanities

Termez University of Economics and Service

Abstract: *This article examines the lexical-semantic processes by which information technology (IT) terminology is integrated into the Uzbek language. Drawing on methods of semantic derivation, metaphorical and metonymic transfer, and borrowing, the study traces how English-origin technical terms are assimilated, adapted, and codified within Uzbek. The article also discusses the role of computational lexicography in documenting and systematizing the expanding IT lexicon, and argues that systematic terminographic research is essential for the continued development of Uzbek as a language of science and technology.*

Keywords: *IT terminology, Uzbek language, lexical-semantic analysis, semantic derivation, computational lexicography, borrowing, metaphorical transfer.*

Introduction

The rapid development of digital technologies has contributed to the growing importance of information technologies across all fields, including linguistics. Modern technical tools enable numerous tasks to be performed quickly, efficiently, and at a high level of quality. The application of digital technologies in linguistic research — particularly in solving terminological and lexicographic problems — is yielding effective results.

As the IT sector continues to expand in Uzbekistan, an ever deeper need arises for the systematic translation, adaptation, and interpretation of IT-related terminology. IT Park, established in 2019 as an offshore free economic zone for IT companies, has accelerated the growth of the sector and increased the demand for qualified specialists and corresponding linguistic infrastructure. This article investigates how IT terminology enters, develops, and becomes established within the Uzbek language system.

Computational Lexicography and the Uzbek Language

One domain at the intersection of linguistics and information technology is computational lexicography — the field concerned with creating methods and software systems for processing textual data to compile dictionaries. A key task within this field is the automatic generation of dictionaries from texts written in the Uzbek language, which requires the development of suitable algorithms and supporting software.

Automatic dictionaries serve two functions: they facilitate lexicographic and statistical observation at the initial stage of natural language text analysis, and they provide an information-theoretic description of the language, supporting syntactic analysis of parts of speech, morphological structure, and informational measures of graphemics, grammar, and the lexicon.

As A. Nurmonov and B. Yo'ldoshev have noted, the creation of a frequency dictionary of the modern Uzbek literary language is an extremely complex undertaking, and a complete frequency dictionary has not yet been compiled. Resolving this challenge requires a comprehensive statistical study of all major functional styles of the language — scientific, literary, colloquial, official, and publicistic — as well as its genres, including the periodical press, fiction, oral folk literature, and living spoken language. Only on this basis can high-frequency words and grammatical forms be identified for each style and genre, providing the foundation for a complete frequency dictionary.

Addressing these challenges requires close collaboration between Uzbek linguists and computer scientists. The linguist's unfamiliarity with the principles of algorithmics and programming, and the informatician's limited command of linguistic grammar, create barriers that can only be overcome through interdisciplinary cooperation.

The following requirements have been established for software generating automatic dictionaries from Uzbek-language texts:

1. Reading text from files (with .rtf, .doc, .docx extensions), processing the text, writing the resulting dictionary to a file, and exporting the dictionary to software environments such as MS Excel and MS Access.
2. Formatting the input text in book form and numbering the pages.
3. Printing each word in the format W S P(F), where W denotes the word, S denotes the word's frequency (number of occurrences in the text), P denotes the page number, and F denotes the frequency of the word on page P.

4. Accounting for repeated and consecutive words, including compound forms such as kamdan-kam (rarely), yuzma-yuz (face to face), and birin-ketin (one after another), which are treated as single words.

Among the limitations of current IT lexicography systems, the following issues remain unresolved: words appearing inside quotation marks may be read as separate tokens; certain letter-based expressions are entered as a single unit; and some words appear in two variant forms (e.g., olam-jahon, ro'y-rost / ro'yirost), both of which must be recognized independently. Despite these limitations, developed software can be applied in creating automatic dictionaries, conducting statistical analysis of literary texts, determining letter frequency, developing information retrieval and spell-checking systems, building language instruction software, and compiling the national corpus of the Uzbek language.

Semantic Derivation in IT Terminology

Semantic term formation is one of the traditional and effective methods of creating specialized designations in the course of the development of the language of science. The semantic method of forming new words consists in developing a new, secondary meaning within an already existing word, on the basis of the similarity between a newly designated phenomenon and an already known one.

Semantic derivation is the process by which semantically derived meanings, compound meanings, and semantic senses emerge within a word — that is, the process of expanding the semantic scope of a word leading to semantic syncretism, followed by the fragmentation of that syncretism, ultimately giving rise to polysemy. It is characterized by two principal types: metonymic and metaphorical processes of change in the semantic structure of a word.

The following table illustrates examples of semantic derivation in English and Uzbek computer terminology:

Table 1. Computer Terms Based on Semantic Derivation

In English	In Uzbek
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function — an attractive capability offered by a program; **kernel** — the core nucleus of an operating system; **lock** — blocking (of a file, database, etc.); **batch** — (n.) a packet; (adj.) group, mass; (v.) to collect data, to form a set of messages.

o'chirish (Eng. delete) — deletion of data or files from computer memory; **kadr** (Eng. frame) — a fixed-format data block transmitted over a communication channel; **ramz** (Eng. character) — a graphic symbol; **takt** (Eng. timeslot) — the minimum unit of computer time.

Term formation arises primarily as a result of the expansion of the original word's meaning. A comparison of the Uzbek terms listed in the table with their corresponding English equivalents shows that the influence of the English equivalent is not always clearly observable.

In the lexical-semantic formation of terms in the Uzbek language, the expansion of word meaning is frequently combined with borrowing, and semantic shift occurs by analogy with English, as in: *xotira* (memory), *karta* (card), *kengaytma* (extension), *saqlash* (save), *o'chirish* (erase), and *do'stona* (user-friendly).

Various methods of meaning development can be observed in computer terminology. The field widely exhibits different types of metaphorical transfer, some prominent examples being:

- hardware — equipment (the semantic transfer is grounded in the material constituting computer components — metal of various types);
- wizard — a specialized program enabling navigation in Windows applications, facilitating work with the operating system and performing complex operations quickly and easily, "as if by magic" (a metaphor based on the peripheral sense of the literary meaning of wizard — "sorcerer, miracle-worker");
- patch — a section of a program introduced to correct an error (general literary meaning: "patch");
- folder (Uzb. *papka*) — a directory containing other folders and/or files;
- shell (Uzb. *qobiq*) — an intermediary program between the user and the computer.

In each of these cases, a name is transferred to a new technical object on the basis of a shared general function or physical resemblance, illustrating the central role of metaphor and metonymy in generating IT terminology.

At the initial stage of lexical-semantic assimilation of borrowed units, their semantics have not yet been fully internalized by native speakers of the receiving language. There is a degree of vagueness in semantic boundaries and a certain facility of semantic shifts. This affects the highly specialized terminological lexicon to a lesser extent, since the defining property of a term — its function as a lexical unit with a strictly defined conceptual core — exerts its influence. Among the peripheral computer vocabulary denoting non-specialized concepts, variability in meaning and interpretation is considerably greater.

At the beginning of the process of lexical-semantic assimilation, a borrowed term and a native term denoting the same concept may coexist simultaneously. For example: yordamchi dastur // dastur dasturi (utility); namuna oluvchi // namuna oluvchi (sampler). In the course of further development, the native term is typically replaced by the borrowed one, or the borrowed term falls out of use.

The final stage of assimilation of a borrowed word is considered to be its appearance in the dictionaries of the receiving language. Among terms recently introduced into Uzbek, the following may be identified: ekokonferensiya (ecoconference), provaydar (provider), and onlayn (online). The terms chat, sayt (site), Internet, drayver (driver), chip, and elektron pochta (email) are now found in reference dictionaries, attesting to their full lexical integration.

Lexical-semantic groupings are words belonging to the same part of speech united by identity or similarity of meaning. Such groupings may be broader in scope (referred to as categories) or narrower (referred to as groups, series, or pairs). The most significant types are:

- lexical-semantic groups — sets of words sharing a common thematic or conceptual field;
- terminological groups — clusters of specialized terms within a defined subject domain;
- synonymic series — sets of terms with overlapping or equivalent meanings;
- antonymic pairs — terms standing in opposition to one another.

What unites all these groupings is that they possess a subject-conceptual basis, though their internal semantic structure and their relationship to the broader language system differ. Some compilers of terminological dictionaries, such as V. L. Grigoryev, have pointed to the ambiguity in the understanding and use of computer terminology

encountered in translated specialized literature — a problem that reflects the ongoing challenges of IT terminography.

Conclusion

The lexical-semantic analysis of IT terminology in the Uzbek language demonstrates that the rapid development of information technologies has significantly influenced the enrichment and modernization of the national lexicon. The formation of IT terms occurs through various mechanisms, including semantic derivation, metaphorical and metonymic transfer, borrowing, and adaptation of foreign lexical units. English remains the primary source of new technological terminology, and many borrowed terms gradually undergo lexical-semantic assimilation within the Uzbek language system.

The analysis confirms that lexical-semantic changes play a crucial role in the integration of new technological concepts into Uzbek. Borrowed and semantically derived terms contribute to the expansion of the language's expressive and communicative potential, ensuring its ability to reflect contemporary scientific and technological realities. Therefore, systematic research on IT terminology and its semantic development remains an important task for modern Uzbek linguistics and terminography.

Borrowed units are present at both the initial and advanced stages of lexical-semantic assimilation, as well as among fully integrated units. Close collaboration between linguists and computer scientists will remain indispensable in advancing computational lexicography and ensuring that the Uzbek language keeps pace with the rapid evolution of global information technology.

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