ENGLISH COMPUTING TERMINOLOGY AS A SYSTEM

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The present article is a survey of Modern English computing terminology with focus on ways of terminological word-formation, structural and semantic peculiarities of the terms and their motivation. The analysis centers around such characteristics as activity, productivity, occurrence, type of lexico-semantic category to distinguish features that prove the system character of computing terminology. Terms for analysis were taken from different English and Lithuanian general and special dictionaries, course books, as well as texts in computing. Understanding computing terms structural and semantic specific features will facilitate teaching and improve academic performance.

Keywords: computing term, word-formation, structural model, lexico-semantic category, nomination, system.

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Introduction

The problem of system character of word-formation is linked to the problems of morphological divisibility, word-formation derivation, word-building relations and potencies. Wordbuilding system is understood to be a peculiarly organized unity which is different from other linguistic systems both in its being composed of specific units and in the way of their structural organization and distribution. The system character in word-formation can be studied on the basis of terminology primarily because terminology is consistent and the system of terms defines interrelated concepts. Due to intensive development of computer technologies the possibility to consider terminological lexis from different points of view, namely to analyze its morpheme, word-building and semantic structure seems timely. Computing terminology is an example of young terminology: being formed in the middle of the 20th century it is still in the process of active development. The dynamic character of computing terminology makes it suitable for the study of means of linguistic nomination. A survey of system character of computing terminology seems important for the practice of English language teaching, ensures better understanding and mastering of the terms, improves the efficiency of academic performance.

Defining and describing the system character features of terminological units determined the use of the following methods: structural analysis, word-building modeling, semantic analysis and immediate constituent analysis. The word term comes from Latin terminus: land mark, boundary. Terminus was the god of land mark and boundary stone in Ancient Rome and guarded the inviolability of the land lot. (Сєліванова 2010: 736). Term is a word or word-combination which denote the notion of a special realm of communication in science, industry, technology, art, in a definitive field of knowledge and human activity, that is a special purposes linguistic unit (Лейчик 2007). Computing terminology is understood to be a unity of terms which makes up a special system of terminological lexis in English. Terminological system as a unity of terms is being formed up on the basis of one concept and reflects the relations between the concepts of a definite realm of science and technology (Лейчик 2007).

Keeping in mind that terminology is a subsystem of the general lexico-semantic system of a language, it contains all structural word types, all means of nomination and all semantic processes that are characteristic of the lexis in general. Specific character of any terminology manifests itself in different realization of the above processes depending on the type of science and technology, history of its development and typology of a national language. Particular characteristics of computing terminology are determined by these factors as well. The system of computing terminology means of nomination can be considered from different points of view: terms structural types, ways of terms formation, distinguishing units of primary and secondary nomination. These approaches do not contradict but rather complement each other enabling to create a comprehensive pattern of computing terminology.

Ways of computing terminology word-formation

Analysis of linguistic literature on the subject made it possible to distinguish the following structural types of terms: underived, derived, compound, terminological word-combinations, abbreviations. Term's structural model is understood to be a general amount of term-elements and their system organization (Даниленко 1975).

Monolexeme terminological units constitute a relatively small portion of the general amount of lexical units being analyzed. Nevertheless these terms define basic notions in this field and are used more frequently. Structural model of a nominal radical morpheme type (e.g. *card, code, deck, file*) is the most productive one among underived English computing terms.

Terms-underived words are characterized by a developed semantic system which in its turn allows to conclude that semantic method of word-formation is productive for the analyzed terminology. Metaphoric change and restriction of meaning are two main types of semantic changes.

Synchronic analysis of English computing terms creates the impression of abundance of Latin borrowings or terms coined on the basis of Latin elements. Diachronic analysis shows that the majority of one-lexeme terms were formed by means of intralinguistic borrowing. These are borrowings from literary language, technical language, and from terminology of related sciences: from the field of mathematics and logic, analytic-synthetic processing of information, electric engineering and organization of production processes. Etymological analysis of one-lexeme computing terms allows to state that in many cases a link is preserved between a contemporary meaning of the term and a definite initial meaning of a classical root. Preservation of this link leads to the emergence of terms with transparent etymological structure (e.g. comparator) and terms with motivation being based on links of associative terminological meaning with lexico-semantic variant of Latin root (e.g. processor).

The number of derived terms by far outnumbers the underived ones; though the variability of their affixes is somewhat limited. This feature proves the regular character of computing term-formation system. The word-building structure of terms-derived words contains a large number of word-building models, the most productive ones consisting of verbal root morpheme and suffixes. The most widely used suffixes are: -er/-or, -ion/-tion, -ing, -ity. Terms ending in –er/-or are the most recurrent ones. This may be explained by the very object of this realm of science and technology that is computer with its components, elements and also means that ensure its functioning. This suffix is used to denote a device, instrument in many other fields of technology as well.

Intensive use of mainly Greek-Latin origin suffixes (sub-, tele-, inter-, de-, multi-, macro-, super-, etc) is a specific feature of the wordforming system of derived computing terms. Due to their international language relevance they ensure a more exact definition of the notion in general and thus specify its meaning. As classical roots and word-forming morphemes are frequently used in the process of term formation, acquisition of the terminological meaning by a common word occurs and new terms are formed on the basis of existing ones, it has become possible to distinguish terms with motivation being based on associative links of terminological meaning with lexico-semantic variant of a Latin root (e.g. *collator*, *processor*).

Compound terms are not numerous in computing terminology. Compound is close both to a word and to word-combination. Compound terms are not structurally homogenous: simplex, derivative, compound stems, clipped first and second components, and abbreviations may be components of compound terms.

Computing terminological system is marked by heterogeneous activity of stems involved in term compounding and varied occurrence of word-building models. Stems of different parts of speech demonstrate diverse activity in term compounding as well.

Noun and adjective stems distinguished by their word-building possibilities are the most active ones in term compounding. Both derived and underived noun stems are the most frequent components of compound terms.

When the second component of a compound term is a nominal stem, the first component can be the stem of present and past participle, the stem of an adverb, a numeral, a preposition, e.g.: *first-order*, *10-key*, *in-out selector*, *normally-off*, *far-out*, *remote-down*, *real-around*, *last-in*, *two-dimensionally*. Adjective stems are in most cases in the positive degree, seldom enough in the comparative and superlative degree, e.g.: *higher-speed*, *highest-quality*.

Compound terms formed according to the models adj+n, n + n are the most frequently used ones. In many cases the following tendency is true: the more productive is the word-building model, the more frequently it is used.

Compound terms reflect computing notions in different ways. There exists a connection between the structure of a term and its lexical meaning.

Compound terms of adj + *n* type are most widely used to describe the principles of a computer structure, its parameters, hardware, software, programming languages: *higher-speed*, *mainframe*, general-purpose, special-purpose, low-cost, small-system, single-board, high-performance, low-level, high-end, long-term, singlestep, variable-point, single-precision, new-line, high-pass, low-byte, discrete-time, double-precision, double-length, deep-depletion, high-volume, high-density:

- computer input-output control description: double-density, hard-copy, high-quality, highest-quality, full-screen, single-rock, single-density, digital-readout, narrowband, operational amplifier, small-input, full-duplex, parallel-data, serial-data, single-wire;
- or naming computer elements, including the description of logical scheme, triggers, integral microcircuits: single-input, open-collector, discrete-component, positive temperature, thin-film, single-chip, multiple-function, continuous-path, complementary-symmetry.

Syntactic way of computing term formation is a productive one due to complex logical-conceptual system of such terminology and the necessity to define the meaning of the notion most accurately.

Syntactic way of computing term formation comprises two-, three- and four-component word-combinations. The distinguishing feature of a word-combination as opposed to a compound is manifested above all in formal grammatical peculiarities of its composition, in its structural characteristics. Two-component attributive word combinations with a modifier in preposition that correspond to structural models A + N and N + N having the meaning "modifier-modified" are the most widely used types of terminological word-combinations. Nominal word-combinations are the most active ones, the right position component being their nucleus: system, computer, device, program, control, storage, memory, unit, code, data, method, mode, set, etc. In the left position the most active components are: data program, control, system, card, address, machine, file.

An adjective component may be primary or derived one and a nominal component may be primary, derived or less frequently a compound word.

It should also be mentioned that terminological word-combinations formed according to the models N + A + N, A + N + N, N + N +N, PII + N, PI + N, A + PI are among the most frequently used ones.

The necessity to give more information by means of extending a word-combination is confronted with limitations imposed by the structure of a definite syntactic model. Limitations of possible extension depend primarily upon grammar potencies of the model itself and consequently upon grammatical forms that constitute the word-combination.

Being a member of the sentence, terminological word-combination can't but conform to the general aims of communication (giving and getting information), thus it can't extend endlessly.

The length of a word combination is also limited by a special nature of scientific style and scientific discourse, both being marked by laconic, clear and logic manner.

The presence of a large number of terminological word-combinations in computing terminology system brings about an opposite phenomenon, i.e. compression, which leads to the formation of a substantial number of abbreviations, being of syllable type, letter-syllable and clipped. Terminological units recurrent both in literature and discourse and denoting basic concepts of computing manifest the tendency to abbreviation.

There exist a large number of abbreviations connected with the terms *memory*, *register*, *unit*, *system*, *processor*, etc.: *RW memory*, *RAM*, *USB-memory-stick.*, *HAM*; *TBR*, *PR*; *CPU*, *NTU*, *ACU*; *DBS*, *ESS*, *HDBMS*; *HEP*, *ISP*, *GWP*, etc.

According to their structural characteristics computing abbreviations are in most cases alphabetic acronyms. Some structural parts of speech (articles, particles and conjunctions) may be used to form computing abbreviations along with stems of notional parts of speech, e.g.: CUE – Computer Up-Date Equipment, NLP – Non-Linear Programming.

Computing abbreviations can also be formed by omitting the stems of notional parts of speech (nouns, adjectives, present and past participles) and whole word-combinations: NMC – Network Measurement Center, MPS – Modular – Runtimelinkable Programming System, BTM – Batch Time-Sharing Monitor. In abbreviations LF (Line Feed Keyboard Key) and RO (Rub-Out Keyboard Key) the word-combination Keyboard Key is totally omitted.

There exists a clear-cut dependency between the term's structural characteristics and its motivation. This proves that semantic potency of a lexical unit is determined, in particular, by linguistic character of its components and the way they are united (Харитончик 2007). Underived words are structurally the simplest ones including only one lexical morpheme. The act of term formation comes to semantic word formation. And there is a possibility to depict only one single feature of a notion. It means that the relation between the inner form and lexical meaning is manifested in concordance of the only one semantic notion.

The structure of derivatives includes both lexical morpheme and a word-forming affix.

Thus, such structural type allows to hypothetically define at least two features of a concept in the process of term formation, leading to a greater motivation as compared to underived words (Cruse 1995; Уфимцева 2002).

Compound words also consist of two lexicosemantic components, most often of two stems. Stem's ability to fully and accurately express necessary information is more substantial than that of an affix. Thus, it is possible to speak about an increase in motivation as compared to derived words.

Word-combinations comprise both underived and derived words as their components, less often compounds. This results in a higher degree of motivation.

The length of the term also influences the degree of motivation, reaching its maximum in 2–4 word-combinations.

Terminological word-combinations of N + N + N structural model have the highest degree of motivation in the English computing terminology system, terms-underived words having the lowest degree of motivation (Бялик 1985).

Semantics of computing terms is determined to a great extent by logical-conceptual system of this realm of science. Based on the semantics of nuclear component it is possible to distinguish lexico-semantic categories (LSC) peculiar to the lexico-semantic computing terminology system in general:

- 1. LSC "an object/ material body" (terms that denote objects of reality: computers, details, elements, devices, etc).
- 2. LSC "process/movement" (terms that denote process, action, state).
- LSC "quality/feature" (terms that denote quality quantity, extent, characteristic features).
- LSC "abstract logical notions" (terms that specify most general logical notions, mathematical notions, programming languages, etc.).

Terms that may be attributed to LSC "object/ material body" (denoting equipment, i.e. hardware) are the most representative of computing terminology. Terms that belong to LSC "quality/feature" are inconsiderable in number. It is possible that such terms lack semantic features necessary to denote a certain scientific-technical concept.

A definite set of structural models is mainly used in term-formation of a certain LSC. Terms that belong to LSC "object/physical body" are formed according to the models N + N, A + N, PI + N, N + A + N. Terms that constitute LSC "process/movement" have structural models A + PI, PII + N.

Conclusions

- Computing terminology is an organized unity of interrelated elements, i.e. terminological units, its specific character is revealed in structural organization and ways of formation. Syntactic way of wordformation and abbreviation dominate in Modern English computing terminology. This tendency is being caused by extralinguistic factors.
- Correlation of terminological units is manifested in the possibility to form structurally and semantically related derivatives from one root. Emphasis on this relation in English computing terminology teaching will considerably facilitate its mastering and stimulate the academic performance.
- 3. Underived, derived and compound computing terms are mainly nominal ones, as it is the noun that denotes fundamental concepts of this field of knowledge.
- 4. Motivated term denotes the specific character of a concept, the term's inner form insuring the accuracy of a definition. In this respect terminological word-combinations are most explicitly and coherently motivated.
- 5. Terminological word-combinations fully express the idiosyncratic features of a notion and its numerous relations with other notions within the computing terminological system. Hence terminological word-combinations meet the requirements

of terminological nomination in full, and are widely used as means of linguistic nomination.

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ANGLŲ KOMPIUTERINĖS TERMINOLOGIJOS SISTEMINĖS SAVYBĖS

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Straipsnis yra skirtas kompiuterijos terminologijos tyrinėjimui, išskiriant terminų sudarymo sistemines savybes. Straipsnyje analizuojami terminų sudarymo būdai ir leksika, taip pat aprašomi jų struktūriniai modeliai, pabrėžiant tokias terminų savybes, kaip produktyvumas ir aktyvumas. Autorė pateikia dažniausiai vartojamų kompiuterijos terminų semantines charakteristikas, tyrinėdama terminų tematinio savitumo ir jų struktūrinių savybių ryšį. Optimizuojant mokymo procesą ir tobulinant anglų kalbos dėstymo metodiką aukštojoje mokykloje, kompiuterijos terminologijos sisteminių charakteristikų suvokimas yra būtinas, kadangi padeda studentams geriau suprasti ir įsisavinti specialybės terminus anglų kalba.

Reikšminiai žodžiai: kompiuterijos terminas, žodžio daryba, struktūrinis modelis, leksinė-semantinė kategorija, nominacija, sistema.

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