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Terminology in IT sphere in modern English: structural aspect

The present article presents the results of the study of the terminological system of the sphere of information technology in modern English. The analysis of the grammatical structure of terms and terminological units in the abovementioned sphere has been carried out. Most common, least common and not common ways of formation of terminological units of the specified subject area have been identified.

Key words: terms; terminological units; English; grammatical structure; information technology.

In the current article the results of the linguistic analysis of the grammatical structure (parts of speech) of terms and terminological units in the topical and developing scientific sphere of information technologies in modern English are presented. Most common, least common and not common ways of formation of the specified terminology have been identified which will enable us to predict the most and least popular ways of nominating special notions and objects of the abovementioned scientific sphere.

A large number of publications are written annually in scientific and technical journals in English by scientists from different countries. English is used for international communication to exchange information coded in terms and terminological units throughout the world.

Terminological units are special lexical units that are used to denote special notions and objects in special subject areas [1, 2]. Terms and terminological units have been identified on the basis of traits of a term and placement in scientific and technical texts: being attributive (nominative) groups they can be used as a subject or an object in a sentence according to an English grammatical structure SVO; they can also start with an article or preposition or end in an article or preposition in case there is another terminological unit after it [6]. A characteristic feature of the English language is in the use of attributive (nominative) groups. They are chains of words where a final word which is in a post-position of a group is expressed with a noun and the other parts in a group can belong to different parts of speech and are widely used in scientific and technical texts in English. Attributive groups form compression due to the absence of prepositions within a group. Terminological units continuously appear in scientific and technical publications due to novel notions and objects because of scientific progress which encourages research of terminology in order to identify most common and least common ways of term usage.

185 terminological units have been selected by a continuous sampling method from scientific and technical journals [3, 4, 5, 7] in the sphere of information technologies for 2022 on the basis of the traits of a term – the ability to nominate special notions and objects, the absence of emotional coloring, the absence of polysemy and synonymy, unambiguity within one scientific sphere and motivation (lexical and semantic transparency) [1, pp. 48, 171].

There have been found terminological units relating to the core of information technology that are widely used to nominate notions and objects: a) *smart* (19): *smart energy storage systems, smart battery-photovoltaic system, smart BMS approach*; b) *technology* (17): *human-organization-technology, technology acceptance model, task-technology fit model / task-technology fit model*; c) with abbreviation *IT* (15 units): *IT technician, IT adoption scenarios, IT-sharing functions*; d) *network* (12): *IoT cyber-physical network technology, artificial neural network, recurrent neural network, deep neural network*; e) *data* (11): *advanced data mining, data-driven control*; f) *information* (10): *building information modelling*; g) *machine* (6): *machine learning methods*; h) *cloud* (5): *centralized cloud data centers, «core cloud», cloud computing, «edge clouds»*; i) *computing* (4): *fog computing technologies*; j) *software* (3); k) *web* (1): *web-based services*; l) *platform* (2): *network platform*; m) *online / offline* (1): *online-to-offline*; n) *e-* (1): *e-Paper products*; o) *hardware* (1).

The analysis of the grammatical structure (parts of speech) of terms and terminological units has been conducted. Most common and least common terminological structures which are used to nominate special notions and objects have been found. There is a bar chart showing the findings below.

As a result of the analysis of the grammatical (parts of speech) structure (see Fig.1) most and least common grammatical structures have been found: nouns combine with nouns (N + N / N + N + N and more) – 50 units: *information technology alignment, cloud energy storage*; terminological units with adjectives as attributes with nouns – 47: *digital twin concept* (Adj + N + N), *artificial neural network* (Adj + Adj + N); *single-layer network* (Adj-N + N); with present or past participle as attributes with nouns – 25: *cycle-based degradation* (N-PII + N), *web-based services* (N-PII + N) (some of terminological units include both an adjective and participle: *graphic processing unit* (Adj + PI + N)). Terminological units in which elements are connected with prepositions and conjunctions – 9: *unified theory of acceptance and use of technology* (UTAUT) (a prepositional phrase which can be used as an abbreviation with notional words only). There is a change in nominating special objects and notions: terminological units having a preposition can be converted into an abbreviation and a preposition becomes an element of it (*diffusion of innovation* (DoI) theory, *Internet of Things* (IoT), *Narrowband Internet of things* (NB-IoT)).

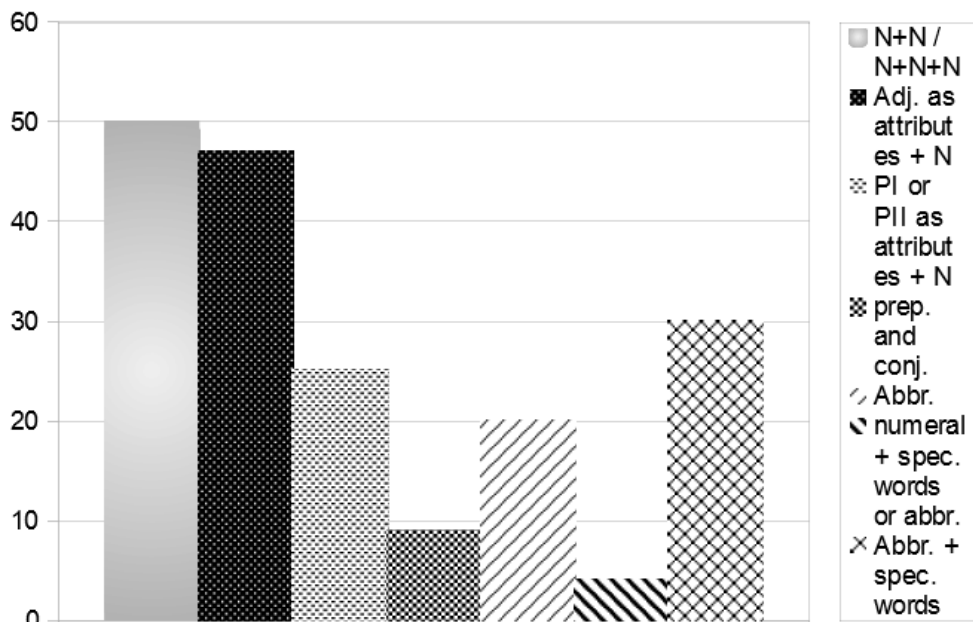


Fig. 1. Analysis of the grammatical (parts of speech) structure of terms and terminological units in the sphere of information technology

Hyphenation is widely used in terminological units (the peculiarity of the formation is that three words in a line in a group are connected with a hyphen): *technology-organization-environment* (TOE is an abbreviated equivalent) framework (N-N-N + N); *holistic human-organization-technology* (HOT is an

abbreviated equivalent) (Adj + N-N-N). Terminological units with hyphenation – 37: *web-based services* (N-PII + N); *machine-to-machine communication* (N-prep-N + N).

Abbreviations comprise 20 units: *BMS*, *BIM*. Terminological units including an abbreviation and special words – 30: *DES system*, *IT system connection*, *smart BMS approach*. Terminological units consisting of a numeral and special words or an abbreviation – 4: *five-stage innovation-decision process model* (numeral-N + N-N + N + N); *vehicle-to-grid (V2G) and vehicle-to-home (V2H) technologies* (there is a tendency in nominating objects and notions in scientific and technical sphere taken from colloquial language when a word can be changed into a numeral (*two* => 2)).

Combinations with prefixes written separately or together with the stem of the word: *semi-empirical degradation models* (pref-Adj + N + N); *bi-party fits* (pref-N + N); *mutual tri-party fit* (Adj + pref-N + N); *bi-party relationships* (pref-N + N); *bi-party relationships* (pref-N + N); *bi-directional relationships* (pref-Adj + N). Least common grammatical structure is represented by *N* (9 units): *monitor*; *server*. There have been found the longest unit which lexical length is 10: *smart scheduling of charging and discharging of energy storage systems* (Adj + PI + prep + N + conj + N + N + prep + N + N + N). It can be assumed that the complication in the structure of terminological units leads to a decrease in the frequency of their use.

On the whole, there have been found the following grammatical combinations: nouns collocate with nouns, adjectives and present participles and past participles. Abbreviations and special words collocating with abbreviations are widely used for nominating as a means of compression. Prepositions are used as part of terminological units which can also be compressed as abbreviations. Hyphenation is also used for connecting both prefixes and separate words in terminological units. Least common ways of nominating are nouns used as single elements. Numerical part is not typical for terminological units.

Thus, the most common grammatical way of nominating notions and objects in the scientific sphere of information technology is adjectival and nominal. Adjectives and nouns are preferably used as attributes to nouns in attributive groups.

Follow-up linguistic study of grammatical structure of terms and terminological units of the scientific sphere of information technology and the ways according to which new terms are coined will be useful for standardization of the terminological system of information technology and codification of terminological units which will enable effective professional communication in the area.

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Special lexical units in the field of nuclear physics and power engineering in modern English: codifiability and frequency

The present article deals with the linguistic problem of identifying codified and non-codified special lexical units in the field of nuclear energy and power engineering in modern English by online dictionaries. The article represents the results of the analysis of codification and frequency of the use of the special lexical units belonging to the specified scientific fields by online dictionaries. The amount of non-codified special lexical units has been identified.