



Diversity of Metaphoric Terms in the Sphere of English IT Communication

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Abstract

The article is devoted to the consideration of the language used by IT-specialists which is enriched with new words, terms, and metaphors every day, as this area is a subject of constant changes, due to which the language does not stand still and develops and expands daily. Undoubtedly, there are words in this field that are narrower and will only be understood by specialists in this field. These words include metaphors, terms, and phraseological expressions that are of the greatest interest, and our work will focus on the analysis of metaphorical units that are found in the field of communication in IT. The authors analyze the metaphorical terms in the field of IT communication and explore the various basic images of metaphors that explain the meaning of these metaphorical units. As it was found out, the word-formation of English terms in the field of IT is a complex process that is undergoing various changes and is in constant development due to the significant progress of the sphere itself.

Keywords: Communication; IT; Language; Linguistics; Metaphor.

1. Introduction

The lexicon of a language is mainly stored in the brain of its speakers, and it has only been stored there for much of human history. We do not understand what shape the 'mental lexicon' has (Alexandrovna Lukankina, Yuvnalevna Shchuklina, Muratovna Amirkhanova, & Zinecker, 2019; Kasemu, N Denmukhametova, & G Khisamitdinova, 2019; M Tukeshova, H Tarasova, & N Luzenina, 2019). However, there is consensus that it consists of individual lexical units that are interrelated to each other somehow. The widely accepted term for lexical units does not exist. The familiar word 'word' is both too wide and too narrow; while it is a word, one does not want to recognize it as a lexical unit, whereas expressions such as to) cut up or red herring are lexical units but consist of many terms. Other words often found are 'lexeme,' 'germa,' or 'lexical entry,' but as these are often used in other ways, lexical units are usually better spoken of. The distinction between a lexical unit and the manner in which it is called is significant. The term house in a dictionary is not the lexical unit, accompanied by all kinds of explanations; it is a name for such a unit. A bundle of different kinds of properties is the lexical unit itself. They include:

- Phonological characteristics that characterize the pronouncement of the lexical unit, including sounds, syllabic structure, lexical accent and in some languages, lexical tone;
- The graphematic properties that characterize the manner in which the lexical unit is written;
- Morphosyntactic properties that define the unit's ability to become part of more complex expressions; usually, they concern the inflection paradigm, word class, relationships between governments, and others;
- Semantic characteristics related to the 'lexical sense' of the unit i.e. The contribution it makes to the meaning of the construction in which it takes place.

There may be any of these properties missing. For graphematic properties, this is most apparent, as not all languages are written. There are a few lexical units, such as the expletive in English, with no lexical sense. Many linguists



often define 'null components,' i.e. units with morphosyntactic and semantic properties but without phonological properties (such as 'empty pronouns'); but these are generally handled instead of in the lexicon in the grammar (Evertz, 2018; Joyce & Masuda, 2019; Maksimov, Gavrilkina, Kuzmina, & Borodina, 2020).

Whereas the defining characteristics of a lexical unit are these four types of properties, other details may be correlated with it such as its etymology, its frequency of use, its semantic equivalent in other languages or its encyclopaedic awareness. In several cases, the lexical units of a lexicon are interrelated. They may share similar phonological features for example, they may rhyme with each other, they may belong to the same paradigm of inflection, they may have the opposite meaning ('antonyms' such as black and white), they may have the same meaning ('synonyms' such as beginning and beginning), or they may adopt the same construction pattern when complex in shape (Boas, 2005; Cruse, Cruse, Cruse, & Cruse, 1986; Lipka, 2010; Mel'čnk, 1988).

These interrelationships are often geared towards lexicological analysis, whereas lexicography tends to give the lexical unit itself more weight. There is much more lexicographical work in general than lexicological work. In fact it is probably an elementary bilingual dictionary if there is some linguistic explanation for a certain language. Not only across languages, but also with regard to the basic lexical properties, the depth of this work differs enormously. Although the phonological, graphic and morphosyntactic characteristics of the lexicon are fairly well represented in Latin, English, French, and a few dozen other languages with a comparable research tradition, for any language whatsoever, there is no technically and empirically satisfactory study of the lexicon's semantics (Corbett, 2015; Dobrov, Dobrova, Grokhovskiy, Smirnova, & Soms, 2018; Meshalkin, Vinokurov, & Grigoryan, 2017; Smith, 2004).

There are three interconnected explanations for this. First, there is no well-defined descriptive language that would allow the researcher, whether simple or compound, to represent the meaning of any lexical unit; the most common practice remains to paraphrase it with an expression of the same language. Secondly, there is no accurate and easily available way of deciding a unit's lexical meaning; the most common way is to look at a number of occurrences in the current text and try to understand what it means. Third, the relationship between a particular form and a particular meaning is hardly ever straightforward; a glance at what even a medium-sized English dictionary has to say about the meaning of for example, on, tone, eye or to) put up is a striking illustration of this. There is not only one lexical meaning, as a rule, but a whole variety of uses that are more or less connected to each other. For the lexicographer, this is not only a practical problem; it also casts some doubt on the very definition of the 'lexical unit' itself (Azarowa, 2008; Olsen & Harvey, 1988; Sekhar & Indira, 2019).

The language of information technologies is characterized by the presence of a lexical structure, which contains words related to the processes of creating, saving, managing, and processing data, including words originating from the vocabulary of high technologies (Jang, Jeong, & Yoon, 2020; Kameneva, 2019). A pervasive lexicon in computer science can be explained by the fact that computers are used by most of the population in modern society, and knowledge of at least basic terminology has become a regular requirement in this region. Thus, the circle of information technology 'language' carriers is widening. It begins to grow, not professional, according to the laws of language widely understood: vernacular language must adhere to universally agreed standards and requirements, resulting in a large number of scientific terms and meanings being terminologized. Studies show that the most basic and derivative IT-technology words are created by the rethinking of common-literary terms by terminology. Nomination processes, which do not change the shape of lexical units, but rather change their values, are referred to as semantic ones. The study of lexical filling in IT texts reveals that the vocabulary consists of the following types of lexical units of modern English-language magazines and journals with the dominant theme 'IT': 1) the terms common-literary language within the context adopted in the common literary language. This is mainly functional words again before, almost now, even, but only, close, just very, quiet, sometimes now, then, today, may, must, and others; 2) Common words of literary language that are usually used in a small, special significance in the IT text. These are words such as: state, event, treadmill, storage; 3) Phraseological terms: see the sun, have an appetite for the body of the industry; 4) Common-literary words, not usually contained in scientific documents, but whose content can be scientifically considered, such as: cloud storage, cloud provider, quality of the cloud; 5) Special terminology: cloud computing, cybersecurity, middleware. Once again, this research demonstrates the predominance of the general science orientation vocabulary in information technology documents. In the lexical region of the language, the most notable transformations are taking place. Basic word-formation methods in machine language are affixation and acronyms, compounding, translation, and contamination. The phrases,



which consist of three or more words, are found in scientific texts and terminological dictionaries. It can be argued that precision is more important to the word than brevity. In this respect, it is not necessary to regard the verbiage of a word as a drawback. Stylistically, professionalism, jargon, slang and words themselves can reflect the terminological system of computers. In terms of its inspiration, the semantic characteristics of the machine term should be considered. As a term or expression in a certain natural language, the word as a lexical unit has or does not have a symbol of inspiration for language in the same way as any lexical unit. A two-component mixture of words (76.46 percent) followed by three-component English terms is the most common type of compound terms in the English terminological lexicon (19.4 percent). Four components and six-five-component terms are also available, but their number is smaller than the number of two-component and three-component terms. Verbo-seterminological word combinations prefer to be abbreviated. An examination of the word's phenomenon, a versatile relationship of its components (denotation, definition and form) allows one object to be linked to several denotations, stressing that the main thing in the context of the word is the generalized essence of the fact expressed in it. A fundamental rethinking of the essence of the term is the fact that the name of one denotation refers to the other, if their meanings are identical in some ways, as a consequence of the reflection of complex cognitive thinking processes. It should be noted that along with one reinterpreted version (non-prototype), the term continues to exist in its original form (prototype) or loses its original meaning. The process of the development, growth and rethinking of the sense of the word, historically considered from the point of view of diachrony and synchrony, is determined by linguistic rules, both within the language system and by extralinguistic forces, which are continuously taking place in the surrounding truth, leading to the emergence of new denotation-the object or definition in society. The study of the most common lexical units in the field of modern information technology makes it possible to conclude that under the influence of extra-linguistic reasons, the emergence of a new denotation in the terminology layer most frequently happens when common-literary language words are used (Corbett, 2015; Lipka, 2010; Meshalkin et al., 2017).

The change or offset of the value based on the name transfer occupies a central position among the linguistic causes of rethinking and changing the meaning of the word, which is characterized by a flexible relation, such as definition and shape, between its parts. Any degree of commonality in their interpretation and comprehension is possible in the presence of different denotations, which is reflected in the use of the old form for the new definition, in which the types of transition depend on the type of bond between the denotation and its denomination. Thus, under the influence of causes of both linguistic and extra-linguistic nature, the meaning can change both quantitatively and qualitatively, accumulating a variety of options that lead to ambiguity (polysemy) and expanding the functionality of the vocabulary (lexicon). The term uses both basic terms (processing, program, database) and the country-wide special definitions of words (candidate-perspective, memory-memory computer, beauty-advantage). When studying vocabulary, the sense of the word in the scheme of concepts in the field of science or technology should be revealed by a logical description, defining the position of the concept appointed by the term. In the learning process, attention must also be paid to the systematicity of the newly developed word. There are guidelines for the formation of words for ideas or objects of a certain class in many fields of knowledge, including computers. In the scientific sub-languages, phrasal verbs, typical of spoken language, are commonly used. We may infer that there is a category of phrasal verbs that constitute the resistant lexical layer (such as setup, bring about and highly specialized words based on the study of their word significance in a sub-language of information technology (e.g., log on, print out) (Corbett, 2015; Olsen & Harvey, 1988).

Stable lexical layer verbs refer to the basic vocabulary and do not have the characteristics of the word to describe the concepts and artifacts in a given domain, but are mainly used only by a small circle of experts. The special vocabulary contains different derivatives of terms, words used in the definition of interactions and relationships between terminologically indicated concepts and objects, as well as a variety of common words used in specifically such combinations and thus specialized, e.g. petal printer – daisy wheel printer, dummy statement – empty operator (statement). As more than half of all emerging inventions emerge in the Silicon Valley, new words are also born there. New terms are arising when working on the invention, and society is forced to use them. And only on the basis of its original form, the word will make a conversational form, appear in a machine slang. It should be remembered that there is no impassable distinction between terms and non-terms. There is constant interaction between them, there is constant exchange. During the time of formation of any terminological scheme, the process of the vocabulary of common terms may be observed (as a characteristic phenomenon). Here, there is a kind of change from a widely known definition to a terminological one focused on the metaphorical and metonymic rethinking of the former. In this case, we are not talking about the various definitions of a phrase, but about different terms, such as handshake – handshake, this term refers to the method of

regulating the synchronous transmission of data to a slow peripheral computer, such as a printer, where each transfer operation involves a confirmation signal; session – session. It's got two definitions: a) an active connection between the user and the computer or between two computers; b) the sequence of operations in which connection is established between the stations on the network, the data exchange is carried out, and the connection is terminated (Olsen & Harvey, 1988). The main purpose of such texts is to convey to the reader or audience the information that is related to new developments in the field of information technology. The target audience includes those people or specialists whose activities are related to the creation, development or operation of certain information systems, high technologies, and the latest methods and means of communication. The process of Informatization of society with the help of computer and telecommunications systems is a direct consequence of its response to the introduction of information technologies in our lives and the need for a significant expansion of those departments of labour productivity, in which most of the information technology is concentrated (M Tukesheva et al., 2019; Mel'čnk, 1988).

The sphere of IT communication is dominated not only by highly specialized vocabulary, but also there is vocabulary that is referred to as "General vocabulary of scientific orientation" (Marion & McCain, 2001; Miles, 1967; Sugimoto, Lee, Murotani, Nagamori, & Moriyama, 2004). This is since the sphere of information technology is becoming increasingly popular among those segments of the population who are not specialists in this field.

According to Sh. Bally, "...metaphor is nothing but a comparison in which the mind, under the influence of a tendency to bring together an abstract concept and a concrete object, combines them in one word" (Balli, 1961). There is an opinion that the concepts of metaphor and term are not comparable, since they are at different ends of the language structure and speech practice, that is, metaphor is inherent in imagery, polysemic, expressiveness (Xamroyevna & Shavkatovna, 2020). In contrast, the term needs concreteness, unambiguity, stylistic and emotional neutrality. However, the process of term formation occurs due to metaphorical transfer and this method is one of the most effective methods of term formation.

1.1. Research Objective

The paper is dedicated to the consideration of the language used by IT experts, which is enriched every day with new words, phrases, and metaphors, since this field is subject to frequent changes since the language, does not stand still and evolves and expands on a regular basis.

2. Methodology

The theoretical and methodological basis of the research is related to the linguocognitive approach to the study of metaphor and problems of communication and is represented by the works of the many authors (Gopnik, 2018; Lakoff & Johnson, 2004; Makhmutova, 2017; Thibodeau, Matlock, & Flusberg, 2019; Filippovich, 2000). The article also uses the works of scientists whose works reflect the general issues of lexical semantics and translation studies (Bednárová-Gibová, 2019; Glanzberg, 2018; Napu, 2019; Partee, 2016).

The research material is metaphorical units operating in the field of IT communication (Putnam, Phillips, & Chapman, 1996; Zubkova, 2016). In total, 100 English lexical units were analyzed by a continuous sample. The main sources were specialized online dictionaries and the English-English Cambridge Dictionary.

Methods of our research are 1) descriptive method, with techniques for collecting, interpreting, and classifying material; 2) continuous sampling method; 3) comparative method; 4) contextual and definitional analysis.

3. Results

The basis for any metaphor is, directly, the image itself. Therefore, the choice of image category is the main factor in the study of metaphor. All the basic metaphorical models are presented in the discourse of information technologies, and the semantics of these metaphors is quite simple.

Metaphors are created based on different types of similarity: of shape, sound or colour, but at the same time, it can be the image itself. For example, Yu.N. Filippovich conducted a study based on the analysis of journal articles in Russian and concluded that the total number of metaphors presented in various categories is represented in 500 contexts. The result of an analysis in percentage ratio looks like this: image "man" – 21.06%; image "animal" – 7.87%; image



“war” – 5.53%; image “food”, “vehicle” – 5.11%; image “object”; image “religion” – 4.68%; image “organism” – 4.47%; image “clothing”; “substance”, “supernatural being” – 3.83%; image “structure” – 2.77%; image “plant” – 2.55%; image “state” – 2.34%; image “reservoir” – 2.13%; image “space”, “weather” – 1.7%; image “disease” – 1.5%; image “birds” – 1.28%; image “music”, “sport” – 1.0%; image “railway”, “wave” – 0.85%; image “mechanism” – 0.64%. (Filippovich, 2000).

Y. A. Sitnikova, in turn, classifies the following models of creating terms-metaphors in English (Sitnikova, 2018):

- *anthropomorphic model*, which includes metaphorical terms related to human characteristics and properties that are inherent in them: various professional tools and actions, items of everyday life, human actions, items related to human activities;

- *non-anthropomorphic model* includes metaphorical units that denote or are associated with objects of the surrounding reality, for example, flora and fauna, various natural phenomena, and so on.

Let's consider this classification in detail. We analyzed 100 examples of English metaphorical terms in the sphere of IT communication and find out that the anthropomorphic model (70 examples) prevails over the non-anthropomorphic (30 examples) one since the first model contains a greater number of metaphorical terms.

For example, we distinguished the following metaphorical units among *anthropomorphic*:

address – address of the memory cell

backbone – a computer network that connects other smaller networks together
bookmark – the address of a web page that is kept on your computer so that you can find it again easily

bounce rate – an indicator of “unnecessary pageviews.”

bridge – device that connects two or more physical networks and transmitting packages from one network to another,

cache – a part of computer memory in which frequently used information can be stored temporarily

carrier services – service of providing the communication lines,

compress – reduce file size to save disk space,

the cookie – set data sent to the user's computer from Webserver

content curation – production of information and creative content

content marketing – marketing technique aimed at creating and distributing suitable and valuable content of informational articles

Data Mining – extracting information from data

desktop – screen panel,

dialog box – a separate area on a computer screen that appears and gives the person using the computer information about what they are doing

drag and drop – with support for dragging objects with the mouse

engagement – user activity in a social network

female connector – power socket

finger – “pointing cross” icon in the form of a clenched hand with an outstretched index finger

folder – program group

frames – image scale

handshaking – confirmation of connection

help desk – technical support service

home page – start page

hypervisor – operating system management program

impressions – the process when the Internet-advertising, article, or another part of the content was “extracted” (or requested) from the source

male connector – plug-in

mood board – materials, text fragments used for the visual representation of the website *packet* – database

pop-up blocker – blocking popup

pull – information requested by the client

resolution – total number of pixels displayed on the monitor screen, and so on.

The following terms can be considered ***non-anthropomorphic***:

bugs – software code defects

cloud – “cloud” remote data storage

cloud computing – method of interaction between the client and the server, in which client information is processed and stored on a remote server, allowing you to reduce the requirements for hardware and software of the client's computer

disaster – unexpected failure of a technical device

firewall – network protection device

FireWire – a way to connect various parts of the equipment, so that they can quickly and easily exchange information

organic content – content on social networks that has a high rating because it was liked by individual users, not because companies paid to promote the content

Trojan horse – malicious program like

worm – a self-spreading virus program and so on.

4. Summary

Metaphor is widely used in our daily lives to express strong emotions, comprehend abstract concepts, and display aesthetic qualities (Yang, Gao, & Li, 2019).

Summing up the results of the analysis of metaphorical terms in the field of IT communication, we can draw the following conclusions:

Metaphor literally permeates all spheres of human activity, occurs both in language and in thinking and action. Metaphor is a tool for expressing mental and cognitive processes that are based on cultural, national, and social characteristics;

Metaphorization is an active process of term formation in this sphere. Metaphorical formations account for a quarter of the lexical composition of the it-sphere;

Metaphorical terms, most importantly, are formed based on certain concepts or images that are an integral part of human life, which, in turn, suggests that English metaphor terms are formed naturally, and are not a linguistic accident;

We determined that anthropomorphic models, related to human characteristics and properties, predominate over non-anthropomorphic ones, which are associated with objects of the surrounding reality.

5. Conclusion

So, this sphere is incredibly interesting, since it reflects the entire progress of humanity, with the help of it people can not only communicate and be in touch but also work, study, create businesses and even save people in emergency situations.

Terminological metaphor, in turn, is known for being a widespread and popular method of naming in both traditional and more developing fields of science and technology. These areas include the field of IT.

Metaphor is one of the main sources of replenishment of the lexical structure of the field of information technology, which is formed on the basis of the common vocabulary of the English language and in the process of borrowing from Latin or Greek.

There are such expressions as “*leech*”, “*flame*”, “*code monkey*”, “*killer app*” and they are widely known. Leech is primarily translated as “a type of worm that lives in wet places and fastens itself onto the bodies of humans and animals to feed on their blood” (Cambridge Dictionary). In the world of flora and fauna, this animal is not the cutest and friendly creature. The same situation is true in the virtual world since this word is used to refer to a person who uses someone else's wi-fi access without permission. The metaphorical expression *flame* in the virtual world is used, in turn, to denote a situation in which two or more users express dissatisfaction with each other in a verbal form. This phenomenon is often found in various forums or discussions. An inept specialist in the field of IT communication is often called *code monkey* since this specialist has not acquired enough experience in the field of IT. Also, colleagues can call another specialist by this name, who works tirelessly, and in return, receives almost nothing. Or the well-known abbreviation “app” from the word “application”. All these examples show that the metaphor is based on an image.

5.1. Contribution

The focus of this work is the study of metaphorical units found in the field of IT communication. In the field of IT communication, the authors examine metaphorical concepts and discuss the various basic images of metaphors that illustrate the significance of these metaphorical units.

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References

- Alexandrovna Lukankina, T., Yuvenalevna Shchuklina, T., Muratovna Amirkhanova, K., & Zinecker, T. (2019). Occasional Derivation as the Result of Creativity of Language Personality (On the example of Yu. Petukhov's novel. *Research in Applied Linguistics*, 10(Proceedings of the 6th International Conference on Applied Linguistics Issues (ALI 2019) July 19-20, 2019, Saint Petersburg, Russia), 972–980.
- Azarowa, I. (2008). RussNet as a computer lexicon for Russian. *Proceedings of the Intelligent Information Systems IIS-2008*, 341–350.
- Balli, S. (1961). *Frantsuzskaya stilistika [French stylistics]*. Moscow.
- Bednárová-Gibová, K. (2019). Synonymic Traps in Selected English Lexical Semantics Terms. *RUDN Journal of Language Studies, Semiotics and Semantics*, 10(4), 754–760.
- Boas, H. C. (2005). Semantic frames as interlingual representations for multilingual lexical databases. *International Journal of Lexicography*, 18(4), 445–478.
- Corbett, G. G. (2015). Morphosyntactic complexity: A typology of lexical splits. *Language*, 91(1), 145–193.
- Cruse, D. A., Cruse, D. A., Cruse, D. A., & Cruse, D. A. (1986). *Lexical semantics*. Cambridge university press.



- Dobrov, A., Dobrova, A., Grokhovskiy, P., Smirnova, M., & Soms, N. (2018). Computer ontology of tibetan for morphosyntactic disambiguation. *International Conference on Digital Transformation and Global Society*, 336–349. Springer.
- Evertz, M. (2018). *Visual prosody: The graphematic foot in English and German* (Vol. 570). Walter de Gruyter GmbH & Co KG.
- Glanzberg, M. (2018). Lexical meaning, concepts, and the metasemantics of predicates. *The Science of Meaning: Essays on the Metatheory of Natural Language Semantics*, 197–225.
- Gopnik, M. (2018). *Linguistic structures in scientific texts* (Vol. 129). Walter de Gruyter GmbH & Co KG.
- Jang, H., Jeong, Y., & Yoon, B. (2020). TechWord: Development of a technology lexical database for structuring textual technology information based on natural language processing. *Expert Systems with Applications*, 114042.
- Joyce, T., & Masuda, H. (2019). On the notions of graphematic representation and orthography from the perspective of the Japanese writing system. *Written Language & Literacy*, 22(2), 247–279.
- Kameneva, N. A. (2019). Analysis of Lexical Features of the Russian and English Languages in the Sphere of Information Technologies. *Russian Journal of Linguistics*, 23(1), 185–199.
- Kasemu, S., N Denmukhametova, E., & G Khisamitdinova, F. (2019). Synonyms in Explanatory Dictionary of Turkic Languages. *Research in Applied Linguistics*, 10(Proceedings of the 6th International Conference on Applied Linguistics Issues (ALI 2019) July 19-20, 2019, Saint Petersburg, Russia), 1025–1032.
- Lakoff, G., & Johnson, M. (2004). *Metafory, kotorymi my zhivem [Metaphors we live by]. Translated from English. Moscow: Editorial URSS.*
- Lipka, L. (2010). *An outline of English lexicology: Lexical structure, word semantics, and word-formation* (Vol. 3). Walter de Gruyter.
- M Tukeshova, N., H Tarasova, F., & N Luzenina, I. (2019). Lexical-Grammatical Analysis of the Phraseological Units with Antonymous Components in the Kazakh Language. *Journal of Research in Applied Linguistics*, 10(Proceedings of the 6th International Conference on Applied Linguistics Issues (ALI 2019) July 19-20, 2019, Saint Petersburg, Russia), 1066–1047.
- Makhmutova, A. N. (2017). Teaching Foreign Language Communication through Scientific Texts. *Conference Proceedings. New Perspectives in Science Education*, 347. [libreriauniversitaria. it](http://libreriauniversitaria.it) Edizioni.
- Maksimov, N., Gavrilkina, A., Kuzmina, V., & Borodina, E. (2020). Ontology of Properties and its Methods of Use: Properties and Unit extraction from texts. *Procedia Computer Science*, 169, 70–75.
- Marion, L. S., & McCain, K. W. (2001). Contrasting views of software engineering journals: Author cocitation choices and indexer vocabulary assignments. *Journal of the American Society for Information Science and Technology*, 52(4), 297–308.
- Mel'čnk, I. (1988). Semantic description of lexical units in an explanatory combinatorial dictionary: Basic principles and heuristic criteria1. *International Journal of Lexicography*, 1(3), 165–188.
- Meshalkin, V. P., Vinokurov, E. G., & Grigoryan, L. A. (2017). Morphosyntactic algorithm for computer-assisted analysis of systematic names of fundamental and modified aliphatic compounds. *Theoretical Foundations of Chemical Engineering*, 51(5), 752–758.
- Miles, S. A. (1967). An introduction to the vocabulary of information technology. *Technical Communication*, 20–24.
- Napu, N. (2019). Translation problems analysis of students' academic essay. *International Journal of Linguistics, Literature and Translation*, 2(5), 01–11.
- Olsen, M., & Harvey, L.-G. (1988). Computers in intellectual history: Lexical statistics and the analysis of political discourse. *The Journal of Interdisciplinary History*, 18(3), 449–464.



- Partee, B. (2016). *Lexical semantics in formal semantics: History and challenges*.
- Putnam, L. L., Phillips, N., & Chapman, P. (1996). Metaphors of communication and organization. *Handbook of Organization Studies*, 375, 408.
- Sekhar, P. C., & Indira, D. (2019). *SENTIMENT CLASSIFICATION ON TWITTER DATA BASED ON LEXICON KEYWORD SEARCH*.
- Sitnikova, Y. A. (2018). Stylistic peculiarities of scientific texts and the strategies of their translation. *Современные Научные Исследования и Разработки*, (10), 28–30.
- Smith, B. (2004). Computer-mediated negotiated interaction and lexical acquisition. *Studies in Second Language Acquisition*, 26(3), 365–398.
- Sugimoto, S., Lee, W., Murotani, M., Nagamori, M., & Moriyama, M. (2004). Developing community-oriented metadata vocabularies: Some case studies. *Proceedings of DLKC*, 4(2004.3), 128–135.
- Thibodeau, P. H., Matlock, T., & Flusberg, S. J. (2019). The role of metaphor in communication and thought. *Language and Linguistics Compass*, 13(5), e12327.
- Xamroyevna, X. G., & Shavkatovna, S. N. (2020). Polysemy of the word. *International Journal on Integrated Education*, 3(1), 85–90.
- Yang, Q., Gao, Z., & Li, Y. (2019). Factors contributing to the aesthetic attractiveness of metaphors in a complimentary context. *Lingua*, 217, 69–79.
- Zubkova, O. S. (2016). Linguosemiotical approach to the study of professional metaphor (based on the material of medical discourse). *Russian Linguistic Bulletin*, (4 (8)).



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