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POLYSEMY AND TERMINOLOGICAL PRECISION IN ENGLISH FOR IT

ПОЛІСЕМІЯ ТА ТЕРМІНОЛОГІЧНА ТОЧНІСТЬ В АНГЛІЙСЬКІЙ МОВІ ІНФОРМАЦІЙНИХ ТЕХНОЛОГІЙ

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The article represents a detailed linguistic study of polysemy and terminological precision in the English language for the IT field. Based on the norms of cognitive and communicative linguistics, terminology studies, and discourse analysis, the paper views English IT discourse as an ever-changing border between natural language and a specialised vocabulary where the forces of standardisation and linguistic creativity are in constant play. Polysemy is not seen as a flaw of language but rather as a natural way of lexical development that encourages metaphorisation, semantic expansion, and cognitive economy. The research covers the fundamental mechanisms of polysemy formation in IT terminology such as metaphorical and metonymic extension, specialisation and generalisation of meaning, and interdisciplinary borrowing. The authentic instances of vocabulary in the modern English IT area (cloud, port, bug, virus, interface, driver, platform, thread, architecture) serve to prove that even highly terminologically regulated units can show different related meanings depending on their access to the communicative context. However, the need for terminological precision is still quite essential in technical discourse to clarify, standardise and facilitate intercultural communication. The research points out that the harmonious coexistence of polysemy and terminological precision functions as a dialectical mechanism which is at the base of the change of scientific and technological language. To put it differently, polysemy is a source of flexibility and creative potential whereas precision is the source of stability and unambiguous reference. The balance between these two phenomena determines the linguistic efficiency of professional communication as well as the continuous development of English IT discourse as a worldwide communicative system.

Key words: polysemy, terminology, linguistic precision, information technology, semantic extension.

Стаття присвячена комплексному лінгвістичному аналізу полісемії та ігнорування термінологічної точності в англійській мові інформаційних технологій. У цьому дослідженні автор базується на рамках когнітивної та комунікативної лінгвістики, термінознавства та аналізу спеціальних дискурсів. Автор визнає, що англійський ІТ-дискурс є областю активного взаємодії типу природної мови й термінологічної системи, що постійно співіснують на межі стандартизації й мовної креативності. Полісемія не є лексичною вадою, а навпаки, характеристикою вербальної техніки, що розвивається через метафоризацію, розширення значення й когнітивну економію. У статті описуються механізми утворення полісемії у ІТ – метафоричні та метонімічні переміщення, спеціалізація й генералізація значення, міждисциплінарне запозичення. Вивчення сучасної англійської терміносистеми інформаційних технологій (наприкладі термінів cloud, port, bug, virus, interface, driver, platform, thread, architecture) як матеріалу розкриває не тільки обсяг й значення терміна, а й його велику семантичну універсальність, навіть у професійному використанні. Натомість, термінологічна точність й надалі є важливою для однозначності, стандартизації та міжкультурної комунікації в інформаційних технологіях. Висновки вказують на те, що співіснування полісемії та термінологічної точності є діалектичним механізмом розвитку мови науки та техніки. Полісемія допомагає мові адаптуватися до нових концепцій та процесів, тоді як термінологічна точність забезпечує функціональну стабільність. Баланс між цими явищами впливає на ступінь професійної комунікації та розвиток ІТ-дискурсу в англійській мові.

Ключові слова: полісемія, термінологія, лінгвістична точність, інформаційні технології, семантичне розширення.

Statement of the problem. The rapid and continuous growth of the Information Technology (IT) industry has not only changed the way the world communicates and does business, but has also influenced the English language used by the global elite. Over the past few decades, English has become the global language of digital innovation, programming, and technology-related writing. This linguistic dominance has resulted in the creation of a vast and constantly changing terminological system in which traditional semantic boundaries are blurred and new conceptual structures emerge at an astonishing rate. The high level of activity in this field inevitably affects the terms used and their characteristics, which is very important for professional and scientific discourse.

There is a need to study the polysemy and terminological accuracy of the English language, which arises from the growing demand for effective and unambiguous professional communication between different disciplines, institutions and language communities. However, IT has penetrated almost all areas of human activity, from cybersecurity and data science to artificial intelligence and software development, making English not just a descriptive language, but a functional tool for technological thinking. Therefore, the semantic flexibility of English, which allows for the rapid introduction of lexical innovations, is often the reason for the phenomenon of multiple meanings of a single term. The presence of both precision and polysemy in IT discourse creates a linguistic environment that is very different from others and requires systematic scientific attention.

Analysis of recent research and publications. The degree of scientific development of the problem shows that polysemy has been considered in various fields, such as general linguistics, cognitive semantics and terminology, in fairly similar studies. According to the works of G. Lakoff, M. T. Cabré and W. Evans, polysemy is one of the features of the human conceptual system, and the authors trace the processes of metaphor and metonymy through which this system expands. [1] In addition, studies by A. Lehrer and M. L. Murphy show that the authors consider the network as a structure of meaning that depends on the variability of the discourse context. [5] However, how exactly polysemy is involved in the field of information technology remains a question that requires research and to which few answers have been given. Therefore, linguistic works devoted to the English language in IT mainly concern issues of terminology formation, translation and discourse analysis, while the question of the correlation between semantic polysemy and terminological accuracy receives little or no attention. The lack of research that integrates the

study of polysemy as a cognitive mechanism and a challenge in communication for a specific profession, thereby revealing the novelty and theoretical significance of this study, is the reason why this research was initiated. [3]

Task statement. This study aims to understand and explain the basic mechanisms underlying polysemy in English IT terminology and the interaction of this phenomenon with the principles of terminological accuracy in specialised discourse. By revealing the dual nature of polysemy, as a source of linguistic innovation, but at the same time a source of ambiguity, the study also aims to provide users with strategies for working with polysemy to achieve clarity in communication while maintaining semantic flexibility.

To achieve this goal, the article formulates the following research objectives:

1. To create a theoretical framework for polysemy as a linguistic and cognitive phenomenon that is relevant to specialised languages.
2. To track changes in English IT terminology and identify historical and pragmatic factors that influence its semantic variability.
3. To identify mechanisms that cause polysemy in IT discourse, such as metaphorical, metonymic, functional, and contextual extensions.
4. To investigate representative examples of polysemic IT terms and their communicative consequences.
5. To develop linguistic and methodological strategies that will help preserve terminological accuracy without hindering the natural process of meaning development.

Outline of the main material of the study. From a methodological point of view, this study is a combination of descriptive, comparative and cognitive approaches. The research is based on examples from authentic IT sources, including technical documentation, programming manuals and professional publications, to ensure that theoretical conclusions are based on real linguistic practice.

English has been the global language of technology and computing since the middle of the 20th century. Terminology for the first computers evolved along the same lines as the changes in electronics, mathematics, and linguistics. At first, the vocabulary was only a few highly technical terms (*algorithm*, *compiler*, *mainframe*). But with the growth of the Internet, digital communication, and user-centered technologies, the vocabulary of IT has become a part of the common English language.

The merging has resulted in the creation of hybrid lexical structures – the combinations of technical and

metaphorical semantics. Terms like *window*, *mouse*, *home*, *cookie*, and *spam* show how common things were semantically changed to describe virtual phenomena. These words make it easier for the users to understand but at the same time, they bring semantic variability across different contexts.

Besides that, technological globalisation has made it possible for English IT terms to be adopted in different languages such as Ukrainian, Japanese, Spanish, etc. In this polysemous terms often keep their ambiguity, thus leading to inconsistencies in interpretation when the translation and localisation are done.

The rise of polysemous terms in English tech language is not just a chance linguistic phenomenon, but a consequence of cognitive and communicative processes which are quite systematic and govern the formation of the meaning. The IT sector keeps on evolving and, therefore, it is incessantly calling for new terms to denote novel concepts and functions. Instead of coming up with completely new lexical units, users and specialists of the language choose to share the existing words by extending their meanings in a figurative, metonymic, or functional way. Such mechanisms, which are strongly connected with human cognition, allow one to have new semantic layers while at the same time keeping the connection with the original sense of the word.

Metaphor is one of the major sources for the creation of polysemy in information technology English. As per cognitive linguistics, a metaphor enables a person to relate an abstract concept or a complicated area to his familiar one by using more familiar, concrete experiences [4]. Technology metaphors are thus the vehicles by which the material world and the digital one are linked, users and experts getting acquainted with the new through similitudes with the physical world.

It seems necessary to consider and describe examples. For instance, the term *cloud* that initially was used for any visible mass of vapor that is made of tiny droplets and was later changed to label “a computer network where files and programs can be stored, especially the internet” [2]. A data storage in a virtual space becomes quite clear by means of the physical features of a cloud, its amorphousness, omnipresence, and invisibility, all these come as a natural conceptual mapping. In the same way, a *virus*, which is a biological entity that causes infection, is a term used for a piece of software, which is developed for malicious purposes, that “infects” computer systems. The metaphor, which draws a parallel between biological and digital infection, was very easy to understand and therefore the public came to grips quickly

with the new technological threat. Nevertheless, in everyday conversation *virus* has once again extended its meaning and is now used metaphorically to refer to anything which spreads very fast in the digital world, for example, *a viral video*. So, one word has created a chain of meanings: biological – technological – socio-digital.

The word *window* is another example. Normally, it is an opening for light or air in everyday English. In the field of IT, the term is used for a part of the graphical user interface through which users can communicate with programs. The metaphorical core, “an opening” giving access or showing, is still. However, the term functions differently, depending on contexts: “Windows” as a brand name (Microsoft Windows), “window” as a software element (browser window, pop-up window), and “window” as a temporal interval. Each meaning is different, but they are still connected by the central idea of a limited space for access or activity.

The example with the *bug* is equally illustrative. Besides its general meaning – an insect, now in computing, it signifies a flaw or error in software code. The term came about when, in the early days of computer engineering, technicians found insects that were causing malfunctions in their electromechanical devices. Since then, *bug* has been used to refer to any kind of defect, from programming errors to hardware problems. The metaphorical use of the term has even led to the word *debug*, which means the removal of errors.

Cognitive metaphors allow one to grasp how the supposed operations of a computer could be carried out by some other kind of device, hence they provide a means of both informing and interlocution. Still, a metaphorical polysemy may result in the ambiguity of an idea, especially for non-experts who might confuse even locals' figurative and technical.

Like a metaphor, metonymy, which is a meaning transfer based on contiguity rather than similarity, is also very significant in the vocabulary of Information Technology. Metonymy gives an opportunity to name one of the parts or the functions of a process, a tool, or an entity thus by a single word. A case in point is the word *port* which was first used to indicate a physical opening or harbor. In computer science, *port* is the name given to a communication endpoint, i.e. a “gateway” through which “wires can be connected in order to control other pieces of equipment” [2]. The change in meaning here is metonymic: a word for a physical passageway is used as a term for a logical.

In the same way, *server* comes from the verb to serve which means an agent that provides a service. A *server* in modern IT can be a machine as well as

a software process, which is performing such functions. The presence of these two meanings shows the natural way professional discourse tends to extend the reference of the existing words according to the functional proximity.

Functional reinterpretation, when the meaning of a word expands or shifts due to technological innovation, changes the original function of the word. The creation of programming languages, user interfaces, and digital architectures have led to many instances of such functional polysemy.

For instance, the word *thread* at one time was just a thin filament of material, but now, in computing, it is the term for an independent sequence of program execution. The metaphorical association with continuity and interconnection has eventually become a quite formal technical meaning. Just like that, *window*, at first an opening in a wall, has got a software-specific meaning as “a separate area on a computer screen that shows information and can be moved around” [2].

The semantic broadening usually follows functional reinterpretation when IT terms get transferred from one field to another. At first, *platform* was the term for the hardware that was the base of a system, but later it started to refer to any structured environment for digital interaction, e.g. a social media platform, a cloud platform, or a business platform. This generalisation process is an example of the conceptual expansion characteristic of the high-tech lexicons, where a successful metaphor or a function-based term becomes a source for the new.

One of the other major polysemy-generating mechanisms is contextual reinterpretation that is closely related to the communicative flexibility of English. In the professional discourse, a single term can have the different but related meanings depending on the context of its use. Thus *architecture* may mean the whole structure of a computer system, the internal design of software, or even the conceptual organisation of data. Each of these meanings is generated from a particular professional context and they all exist there without fully separating from one another.

The expert knowledge and the shared conventions of the professional community are the main factors that support such kind of polysemy. The meaning of a word is clarified not by its form but by the immediate communicative situation. Therefore, context is a kind of a stabilising factor that enables polysemous words to be still efficient and understandable despite their semantic plasticity.

Moreover, the morphological productivity of IT English is quite high which is one of the reasons why

it indirectly supports polysemy. After a core term gets a new meaning it is usually not long before it spawns a host of derivatives and compounds. For instance, the word *cloud* has given rise to *cloud computing*, *cloud service*, *cloud migration*, and *cloud-native applications*. Each of them maintains a link to the central metaphor while at the same time making a certain technical function more explicit. This web of interconnected meanings is an illustration of what cognitive linguists call radial category, where the one prototypical sense unfolds into several specialised.

One of the key aspects of the research is explaining the conflict of functions. The coexistence of polysemy and terminological precision in Information Technology discourse constitutes a linguistic paradox: whereas terminological systems aim at stability and unambiguity, natural language keeps on inventing new meanings by analogy, metaphor, and functional transfer. This interaction mirrors the fundamental duality of language as both a system and a living communicative practice. In the IT sector, where technological innovation and lexical creativity go hand in hand, the conflict between semantic multiplicity and the need for clarity is getting more and more visible.

From a linguistic point of view, polysemy is the capacity of a word to develop multiple, related meanings through processes like metaphorical mapping, metonymic association, and conceptual generalisation. On the other hand, terminological precision is about narrowing down a term to a single, clearly defined concept in a professional context. However, in actual IT discourse, the borderlines between these trends are not solid, and numerous instances show that absolute precision is more of an idea than a practical.

Each of the abovementioned instances reveals that polysemy in IT terminology is not an exception but the norm, which is a result of cognitive economy and communicative necessity. Users of language are continually looking for means to understand the unfamiliar by the familiar, thus they come up with metaphors and analogies that both deepen and make more complicated the terminological system.

Simultaneously, the need for accuracy is still there – in programming documentation, technical specifications, and international standards – where a misunderstanding may result in system failures or data loss. Hence, terminological control serves as a counterbalance to the creative nature of the human language. However, the examples illustrate that even in the most tightly controlled discourses, disambiguation by context is the final interpretative.

Conclusions. To conclude, polysemy in IT English is the result of different factors such as met-

aphorical innovation, metonymic transfer, functional adaptation, contextual usage, and morphological productivity. Behind these mechanisms lies the linguistic creativity and the adaptability of English to the very fast technological change. On the one hand, they extend the expressive power of the IT discourse; on

the other hand, they put at risk the standardisation and precision of the terminology used. Hence, knowledge of these mechanisms becomes indispensable for linguists, translators, and technical communicators who strive to keep clarity while not impeding the natural change of meaning in the language of technology.

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