СЕКЦІЯ 3
МІЖКУЛЬТУРНА КОМУНІКАЦІЯ

УДК 81'33-47.44
DOI 10.32999/ksu2663-3426/2021-2-10

VERBAL AND NONVERBAL MEANS IN THE COMMUNICATIVE SYSTEM OF USER INTERFACE

Semenova Mariia Andriivna,
Graduate Student at the Department of Applied Linguistics
Lesya Ukrainka Volyn National University
semenova.maria@vnu.edu.ua
orcid.org/0000-0003-3370-7750

The article highlights verbal and non-verbal means in the communicative system of the interface, because their large number leads to serious problems of describing the dynamic processes of vocabulary, the justification of new terminology, as well as the provision of interrelated and coherent lexical means of each language. In this regard, research aimed at identifying the specifics of English-language smart-technology interfaces is of particular importance. Thus, the development of man-machine communication sets scientists the task of theoretical analysis and awareness of the communicative, sign nature of this communication.

It was found out that interface is an information system of human interaction with the computer, which is implemented in the form of dialog structures (menu as a data block, as a data string, as icons, dialog boxes). Since terminology is a verbalized result of the specialist's activity, based on the awareness and assimilation of professional experience, it is studied that the terminosystem of interfaces is a kind of "reflection" of how the specialist conceptualizes and categorizes the surrounding reality, what its elements are relevant for him.

In human-machine communication, the system of natural language from creative, linguistic, thinking is transferred to the algorithmic basis of computer programs, while acquiring the static form of artificial language. Functional keys of man-machine dialogue with the help of secondary nomination process reflect objects of real world which surround the user. Within the framework of English-language interfaces of intelligent systems, linguistic systems of language are represented in the form of information frame structures. Non-verbal signs that are used in human-machine communication include: signs with a pictographic signal; signs with an alphanumeric signal.

The study of verbal and nonverbal means in the communicative system of the interface, the active combination of signs with pictorial and verbal signals, as well as the actualization of verbal means at the level of the broadcast system and the use of verbal units as independent means represent current trends in the development of man-machine communication.

Key words: *interface, verbal / non-verbal means, communicative interface system, terminology, human-machine communication.*

ВЕРБАЛЬНІ ТА НЕВЕРБАЛЬНІ ЗАСОБИ В КОМУНІКАТИВНІЙ СИСТЕМІ ІНТЕРФЕЙСІВ КОРИСТУВАЧА

Семенова Марія Андріївна,
аспірантка кафедри прикладної лінгвістики
Волинський національний університет імені Лесі Українки
semenova.maria@vnu.edu.ua
orcid.org/0000-0003-3370-7750

У статті висвітлено вербальні та невербальні засоби в комунікативній системі інтерфейсу, оскільки велика їх кількість призводить до серйозних проблем опису динамічних процесів словника, обґрунтування нової термінології, а також забезпечення взаємопов'язаних й узгоджених лексичних засобів кожної мови. У зв'язку з цим особливого значення набувають дослідження, спрямовані на виявлення специфіки англомовних інтерфейсів smart-технологій. Таким чином, розвиток людино-машинного спілкування ставить перед вченими завдання теоретичного аналізу та усвідомлення комунікативної, знакової природи цього спілкування.

З'ясовано, що інтерфейс користувача – це інформаційна система взаємодії людини з комп'ютером, яка реалізується у вигляді діалогових структур (меню у вигляді блоку даних, у вигляді строки даних, у вигляді піктограм, діалогові вікна). Оскільки термінологія являє собою вербалізований результат діяльності спеціаліста, заснований на усвідомленні та засвоєнні професійного досвіду, досліджено, що терміносистема інтерфейсів

є своєрідним «відображенням» того, як спеціаліст концептуалізує і категоризує оточуючу дійсність, які її елементи для нього релевантні.

У людино-машинній комунікації система природної мови з творчої, мовної, мислячої переноситься на алгоритмічну основу комп'ютерних програм, набуваючи при цьому статичної форми штучної мови. Функціональні клавіші людино-машинного діалогу за допомогою процесу вторинної номінації відображають об'єкти реального світу, які оточують користувача. У межах англомовних інтерфейсів інтелектуальних систем лінгвістичні системи мови представлені у вигляді інформаційних фреймових структур. До невербальних знаків, які використовуються в людино-машинній комунікації, належать знаки з піктографічним сигналом, знаки з буквенно-цифровим сигналом.

Дослідження вербальних та невербальних засобів у комунікативній системі інтерфейсу, активне поєднання знаків із піктографічним і словесним сигналом, а також актуалізація вербальних засобів на рівні системи мовлення та використання дієслівних одиниць як самостійних засобів представляють сучасні тенденції в розвитку людино-машинного спілкування.

Ключові слова: *інтерфейс, вербальні / невербальні засоби, комунікативна система інтерфейсу, термінологія, людино-машинна комунікація.*

1. Introduction

Natural language is a strong and complex sign system and the main way of communication. However, in the last decade the active development of computer channels of information communication leads to the use of natural language in the framework of man-machine communication, presents language as an important tool of cognition, which includes procedures for obtaining knowledge and operations with it. It should be taken into account that the system of natural language in such communication is transferred from the basic creative cultural and thinking activity of a human being to algorithmic basis of computer programs, thus acquiring a static form of artificial language. The artificial language thus involves the most various forms of natural language nomination and develops its new nominative and communicative functions. The main feature of such development is the need to create nominative units, understandable to man, but at the same time such that can be easily set on the algorithmic basis of the computer.

Thus, the main direction in which there is an active development of artificial language is the creation of the interface in its most diverse forms. The natural language system is the starting point for solving communicative-significant problems in the interface system. The development of man-machine communication challenges scientists to theoretically analyze and understand the communicative, sign nature of this communication, constitutes the relevance of the presented research.

The aim of the article is the study of verbal and nonverbal means in the communicative system of the interface.

The set goal implies the solution of the following tasks:

– clarifying the basic concepts of communication theory and terminological lexicology of interface research;

– clarification of the main features of the means;

– analysis of the nature and functioning of verbal and nonverbal means in the communicative system of the interface.

The tasks arising from the purpose of scientific research, provide for the use of the following methods: descriptive and comparative methods (to present the selected material), method of structural analysis (to determine the features of the nomination means morphological composition of interfaces), method of component analysis (to analyze the semantic structure of computer tools based on dictionary definitions).

The Ukrainian Dictionary of the Ukrainian language gives the following definition of interface. Interface is:

1) a common boundary between two objects, the interaction through which is quite definite;

2) the boundary between two functional devices, defined by their functional characteristics, the general mechanical characteristics of the message, the characteristics of exchange signals, etc.;

3) the relationship between any two functional units, including organisms;

4) a set of means that ensure the interaction of computing system devices and programs, as well as their interaction with humans.

Interfaces are closely related to means (terms), which emphasize their correlation with the concept, which refers to a special, professional field of knowledge or activity. To clarify the status of the term and its place in the system of language is devoted a large number of works of terminologists. At the same time, various interpretations of the word term are given in these works and the following requirements are put forward: the requirement of unambiguity, precision, absence of expressiveness, emotionality (Lotte, 1968), the presence of connotations

in the terminological signifier, dependence on the context (Piotrowski, 1985).

"*A scientific term (including scientific and technical terms) is a unit of a particular natural or artificial language (most often a word or phrase), which existed before or was specially created and has a special terminological meaning, which is expressed either in verbal form, or in this or that formalized form and reflects the basic, essential at this level of scientific development, features of the scientific concept*" (Gerd, 1986). It is noted that a term, or a word, or a phrase, is one sign, to which corresponds one concept.

Each term is based on the definition (definition) of the reality it denotes, so that the term is a precise and at the same time brief characteristic of the object or phenomenon. The features of the term include motivation (the emergence of the term is determined by the need to name a special concept), uniqueness (the term denotes a specific special concept in a certain sense), systemicity (the term always correlates with a special concept, which takes its place in the system of concepts, and reflects a part of the conceptual system) , availability of definition, stylistic neutrality (Grinov, 1993).

In our study we use the following definition of the term: A term is a special element of the system, which represents the unity of a sound signal, color code, image with the corresponding concept in the organized system of concepts, and which performs a nominative function.

Taking into account the informational nature of speech activity, in which there is a synthesis of the interaction between language and thought is especially important for the terms serving the work of a person in the information environment. That is, the social conditionality of the development of interfaces is traced. The development of new terminological systems is greatly influenced by the development of information technologies themselves, as a result, it is impossible to consider the term as a component of only one lexical language system, it is necessary to take into account its development in other sign systems (Biskub, 2020).

In the sign-communicative system of the interface we distinguish two types of means: *verbal and nonverbal.*

Let us analyze the identified verbal means. In human-machine communication, the system of natural language from the creative, linguistic, thinking is transferred to the algorithmic basis of computer programs, while acquiring the static form of artificial language. At the current state of development of man-machine communication it can be considered that natural speech is intended not only for the communicative function of language, but also for realization of nominative function of lexical units. Functional keys of man-machine dialogue with the help of the process of secondary nomination reflect the objects of the real world, which surround the user.

For a long period of time terminological schools considered as terms only words which belong to nominative parts of speech as well as nominative word combinations (Lotte, 1982). More recently, verb words and word combinations have expanded the class of terminological vocabulary. In addition to terms that have a nominative function, there are also units indicating semantic and formal relations that exist between terms both in the system of language and in the system of a particular field of study. Such units are called relators (Piotrowski et al. 1985), which can be not only verbs, word combinations, but also prepositional constructions and punctuation marks. Relators, unlike terms, have only a verbal form of expression ("yes", "no", "in alphabetical order"), they are convenient for explaining to the user how the interface system functions ("create", "search"). The wide use of relators in the function of terms is obvious, because they cover different classes of lexical units, and also make it possible to express both paradigmatic and syntagmatic relations.

The issue of actualization of verbal means in interpersonal communication "man-machine" is also important, since the requirements of operative compilation of automatic dictionaries, automatic text processing systems, information search systems, providing human work with a computer make this problem extremely acute.

A possible way to solve it is to complement the "language – speech" chain with another component: the language system. In this approach, the language system is understood as a repository of lexical and grammatical information in its processed form, and the language system is a dynamic system which allows fixing the whole set of possible realizations of system meanings of language in speech (Apollonskaja, 1987). The system of language, in our understanding, is a "bridge" from language to speech, that is a system of rules of construction of the text and its parts.

Within cognitive linguistics, there is a cognitive approach to the study of a term, which aims to explain "the constant correlations and connections that appear between structures of language

and structures of knowledge" (Grinov, 1993). The definition of a concept from the cognitive point of view consists in answering whether a special or non-special structure of knowledge appears before us. If in definition of a word not special knowledge is applied, and knowledge of conceptual ordinary consciousness, then this word is a word of common language. If, however, special knowledge is used in the explanation and in the definition of the word itself, then the word has probably already become a term. The concept is good material for cognitive linguistics, which helps to illuminate more deeply the nature of terms as elements of the lexical system: their motivation, internal form.

In the framework of English-language interfaces of intelligent systems, linguistic systems of language are represented in the form of information frame structures. A frame is a hierarchically organized structure of data obtained by stereotyped knowledge, including processing rules and logical output (Kusko, 2001). Within the framework of man-machine communication, frame structures represent units of the language system in which the basic, most important semantic elements are fixed. So, for example, structure "replace" contains the following slots "find", "replace", "refer", "consider the registry", "whole word", "special criteria" ("find", "replace", "refer", "consider the registry", "whole word", "special criteria"). The sequence of the presented slots reflects the sequence of the user's work with the program. The frame structure itself is a unit of system speech. Filling this structure with slots makes it an actualized unit.

Thus, the means that are involved in communication are some actualization of language units. But due to the absence of context, i.e. holistic grammatically organized units of speech, the studied sign components are not purely speech units in the usual sense of the word. On the other hand, one of the forms of human-machine communication is frame structures, the filling of which by the user takes place in the course of communication itself, and also determines the realization of certain needs. So, the lexical units of man-machine communication are actualized within the language system.

Let's consider nonverbal means. Non-verbal signs that are used in human-machine communication include:

– signs with a pictographic signal;

– signs with an alphanumeric signal.

The use of visual images in the sign communication system of concepts is an important step in the development of the potentialities of artificial language. Visual imagery is at the core of figurative thinking. Visual images, including pictorial gestures and drawings, have great mobility and plasticity, which words do not have. This explains the widespread use of pictograms, as well as color signals within an artificial interface language. In addition, in our opinion, the use of pictographic signals can help to overcome interlanguage barriers.

Pictographic signs are an ancient type of writing. They are characterized by the following features:

– oriented to specific national-verbal forms, because the meaning of drawings is accessible to a native speaker of any language;

– can represent not only images of individual objects, but also look like complex pictorial compositions of narrative nature.

Therefore, within an artificial language, such signs have an undeniable advantage over signs with a signal that is expressed in natural language. Designed for perception by the user, the content of pictographic signs contains a denotative and a referent in addition to the designat. For example, a magnifying glass image for the term "preview" or a scissor image for the term "delete". The reproduction and automation of actions within the iconic system is of great importance for the quick realization of tasks by the user.

The iconic window system, constantly being supplemented with new functions and commands, requires the user to store a large amount of information in memory. In order to process information quickly, it is necessary to have gestalts ready in memory with which to compare the information. Information presented in the iconic window system, as a result of its large volume and constant changes, is often unable to be recoded into long-term memory components. In such a situation, nonverbal, especially pictorial signs, can become useful because the image is more easily remembered by a person than descriptive verbal commands.

The semantics of the pictographs themselves contribute greatly to the development of rapid automatization of actions. In most cases, the semantics of hand movements (scissors, open folder) and eye movements (magnifying glass, binoculars) are involved in the process of familiarization of non-verbal signs, which contributes to the development and creation of functional-volumetric terms. That is why in the sign system of the interface there is an active development of signs on a par with the verbal ones, which constantly interact.

The combination of verbal and non-verbal signs in the HMI communication system follows certain rules. In the windows that we see the function keys are first represented by a non-verbal sign, and only then by a verbal sign. The decoding of non-verbal information by the user, namely pictograms and color signals, contributes to quick reactions and saves time. The combination of verbal and non-verbal signs contributes to the user's perception of the text field as a whole space, taking into account such psychological attitudes as visual thinking, memory, attention.

Alphanumeric signs are a clear sequence of commands that use the names of the keys, which consist of letters, numbers, mathematical signs. For example, Ctrl + Alt + Del - command to call the support system, Alt + F4 - command that allows you to close the document. Such signs are used in menus, as well as in tooltips. They are universal, uniform for all native speakers. The peculiarity of the use of such signs (as in the case of pictographic signs) in the studied communicative-sign system is their combination with the verbal signs. In such cases alphanumeric signs are absolute synonyms of verbal signs (Alt + F4 - "close", Ctrl + Y - "cancel input", Ctrl + X - "cut"). The high functionality of these "shortcuts" simplifies the work, and there are many important in the work of people with disabilities.

2. Conclusions

Thus, the interface – an information system of interaction between man and computer, which is embodied by a dialogue. And here are used the following basic forms of debt structures as: a menu in the form of a block of data, in the form of a string of data, in the form of icons, dialog boxes (question – answer). In general, the terminosystem of interfaces conceptualizes and categorizes the surrounding reality.

It is traced that modern trends in the development of man-machine communication are: the study of verbal and nonverbal means in the communicative system of interfaces, the active combination of verbal and nonverbal terminological signs in interfaces, the combination of signs with pictographic and verbal signals, as well as the actualization of verbal means at the level of the broadcast system, the use of individual relators, namely verbal units, as an independent means.

We consider it promising to study new methods of word-formation models in English-language smart-technology interfaces.

BIBLIOGRAPHY:

1. Апполонская Т.А., Глейбман Е.В. Порождающие и распознающие механизмы функциональной грамматики. Кишинев, 1987. 171 с.
2. Бацевич Ф.С. Словник термінів міжкультурної комунікації. URL: http://terminy-mizhkult-komunikacii.wikidot.com/k (дата звернення: 18.08.2020).
3. Бєлих О.М., Кузьміч О.А. Модель зв'язку : взаємодія вербального і невербального спілкування. Literaturoznawstwo, językoznawstwo i kulturoznawstwo jako treści przekazu we współczesnej glottodydaktyce. Хелм, 2010. С. 8–18.
4. Біскуб І.П. Моделювання комунікації людини й комп'ютера в графічних інтерфейсах оперативних систем. *Науковий вісник ВНУ*. 2012. № 6. С. 9–15.
5. Біскуб І.П. Англомовний дискурс програмного забезпечення як модель мовленнєвої взаємодії людини й комп'ютера : монографія. Луцьк : Волинський національний університет імені Лесі Українки, 2009. 388 с.
6. Biskub, I.P., Krestyanpol, L.Yu. The use of social engineering in developing the concept of smart packaging : *Proceedings of the 2020 IEEE 3rd International Conference on Data Stream Mining and Processing*. Lviv, 2020. С. 348–351. DOI: 10.1109/ DSMP47368.2020.9204105.
7. Герд А.С. Основы научно-технической лексикографии. Ленинград, 1986. 73 с.
8. Гринев С.В. Введение в терминоведение. Москва, 1993. 309 с.
9. Жолковский Ю.С., Леонтьева Н.Н. О принципиальном использовании смысла при машинном переводе. Машинный перевод. *Труды института точной механики и вычислительной техники АН СССР*. 1961. № 2. С. 43–47.
10. Кубрякова Е.С. Язык и знание : На пути получения знаний о языке. Части речи с когнитивной точки зрения. Роль языка в познании мира. Москва : Языки славянской культуры, 2004. 560 с.
11. Кусько К.Я. Фреймова реалізація країнознавчого дискурсу (на матеріалі німецькомовних рекламних текстів). *Мовні і концептуальні картини світу.* 2001. № 4. С. 117–121.
12. Литвиненко В.В. Комунікативна та комунікаційна системи – диференціація понять. *Актуальні питання масової комунікації*. 2013. № 14. С. 30–32.
13. Лотте Д.С. Вопросы заимствования и упорядочения иноязычных терминов и терминоэлементов. Москва : Наука, 1982. 149 с.
14. Пиотровский Р.Г. Методы автоматического анализа и синтеза текста. Минск, 1985. 222 с.
15. Тлумачний словник української мови. URL: https://slovnyk.ua/index.php?swrd=%D1%96%D0%BD%D1%82%D0%B5%D1%80%D1%84%D0%B5%D0%B9%D1%81 (дата звернення: 18.08.2020).

REFERENCES:

1. Apollonskaja, T.A., Gleibman J.V. (1987) *Porozhdayuschie i raspoznayuschie mehanizmyi funktsionalnoy grammatiki* [The generative and recognizing mechanisms of functional grammar]. Kishinov: Stiinza, 171 p. [in Russian].
2. Bacevich, Ph.S. (2010) Slovnyk terminiv mizhkulturnoi komunikatsii [Glossary of Terms of Intercultural

Communication]. (website). Retrieved from: http://terminy-mizhkult-komunikacii.wikidot.com/k (accessed 18 August 2020) [in Ukrainian].
3. Bielykh, O.M., Kuzmich, O.A. (2010) Model zv`iazku : vzaiemodiia verbalnoho i neverbalnoho spilkuvannia [Model of communication: interaction of verbal and nonverbal communication]. *Literaturoznawstwo, językoznawstwo i kulturoznawstwo jako treści przekazu we współczesnej glottodydaktyce,* Chelm, pp. 8–18. [in Ukrainian].
4. Biskub, I.P. (2012) Modeliuvannia komunikatsii liudyny y kompiutera v hrafichnykh interfeisakh operatyvnykh system [Modeling Human-Computer Communications in Operational Systems Graphical Interfaces]. *Naukovii visnik SNU,* no. 6, pp. 9–15. [in Ukrainian].
5. Biskub, I.P. (2009) Anhlomovnyi dyskurs prohramnoho zabezpechennia yak model movlennievoi vzaiemodii liudyny y kompiutera [English Software Discourse as a Model of Human-Computer Interaction]. Monografiya, SNU. [in Ukrainian].
6. Biskub, I.P., Krestyanpol, L.Yu. (2020) The use of social engineering in developing the concept of smart packaging. *Proceedings of the 2020 IEEE 3rd International Conference on Data Stream Mining and Processing*, Lviv, pp. 348–351 [in English].
7. Gerd, A.S. (1986) Osnovyi nauchno-tehnicheskoy leksikografii [Fundamentals of Scientific and Technical Lexicography]. Leningrad, 73 p. [in Russian].
8. Grinov, S.V. (1993) Vvedenie v terminovedenie [Introduction to Terminology]. Moscow: Moskovskii Litstei, 309 p. [in Russian].
9. Zholkovskii, Yu.S., Leonteva, N.N. (1961) O printsipialnom ispolzovanii smyisla pri mashinnom perevode. Mashinnyiy perevod [On the fundamental use of meaning in machine translation. Machine translation]. *Trudi Instituta TM i VT ANSSSR,* no. 2, pp. 43–47. [in Russian].
10. Kubriakova, E.S. (2004) Yazyik i znanie : Na puti polucheniya znaniy o yazyike. Chasti rechi s kognitivnoy tochki zreniya. Rol yazyika v poznanii mira [Language and Knowledge: Toward a Knowledge of Language. Parts of speech from a cognitive perspective. The role of language in cognition of the world]. Moscow: Jaziki slawjanskoj kulturi, 560 p. [in Russian].
11. Kusko, K.J. (2001) Freimova realizatsiia krainoznavchoho dyskursu (na materiali nimetskomovnykh reklamnykh tekstiv) [The Frame Realization of a German Advertising Discourse (based on German advertising texts)]. *Movni i kontseptualni kartini switu,* no. 4, pp. 117–121 [in Ukrainian].
12. Litvinenko, V.V. (2013) Komunikatyvna ta komunikatsiina systemy – dyferentsiatsiia poniat [Communication and communicative systems – differentiation of terms]. *Aktualni pitannja masovoi komunikatsii*, no. 14, pp. 30–32. [in Ukrainian].
13. Lotte, D.S. (1982) Voprosyi zaimstvovaniya i uporyadocheniya inoyazyichnyih terminov i terminoelementov [The issues of borrowing and streamlining of foreign-language terms]. Moscow: Nauka, 149 p. [in Russian].
14. Piotrovstii, R.H. (1985) Metodyi avtomaticheskogo analiza i sinteza teksta [Methods of automatic text analysis and synthesis]. Minsk, 222 p. [in Russian].
15. Tlumachnyi slovnyk ukrainskoi movy [Ukrainian Language Glossary]. Retrieved from: https://slovnyk.ua/index.php?swrd=%D1%96%D0%BD%D1%82%D0%B5%D1%80%D1%84%D0%B5%D0%B9%D1%81, accessed 18.08.2020. [in Ukrainian].

Стаття надійшла до редакції 11.10.2021.
The article was received 11 October 2021.